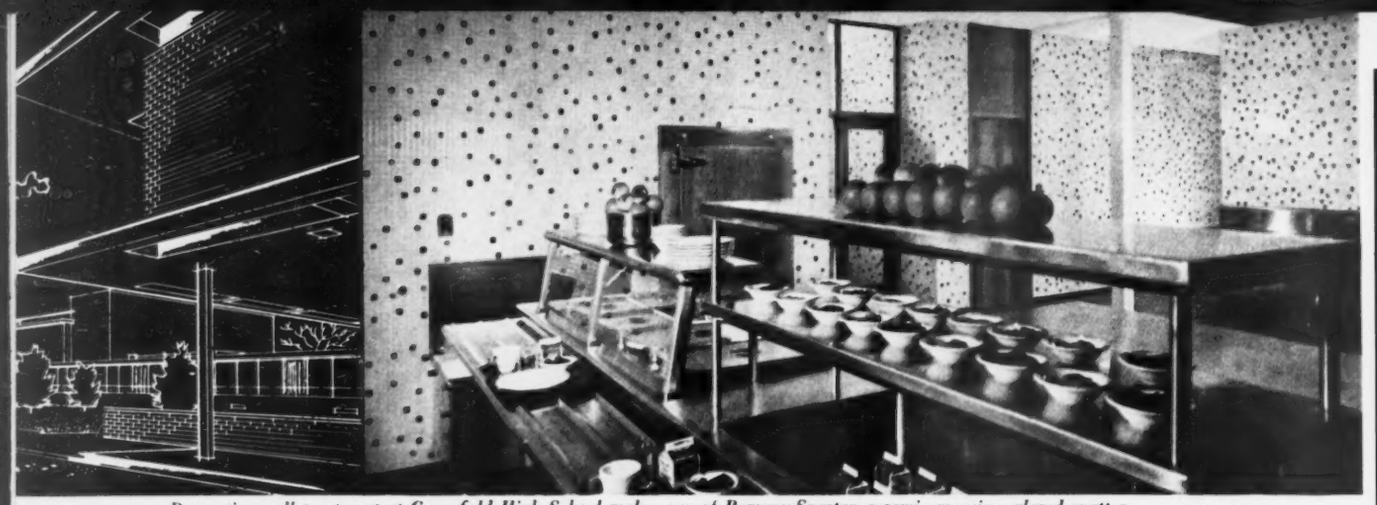
JUNE 1960 VOLUME 2 NUMBER 6

architectural & engineering NEWS



Decorative wall treatment at Greenfield High School makes use of Romany·Spartan ceramic mosaics—glazed spatter pattern in cafeteria—unglazed spatter and custom design in shower room.

Plate No. 1078

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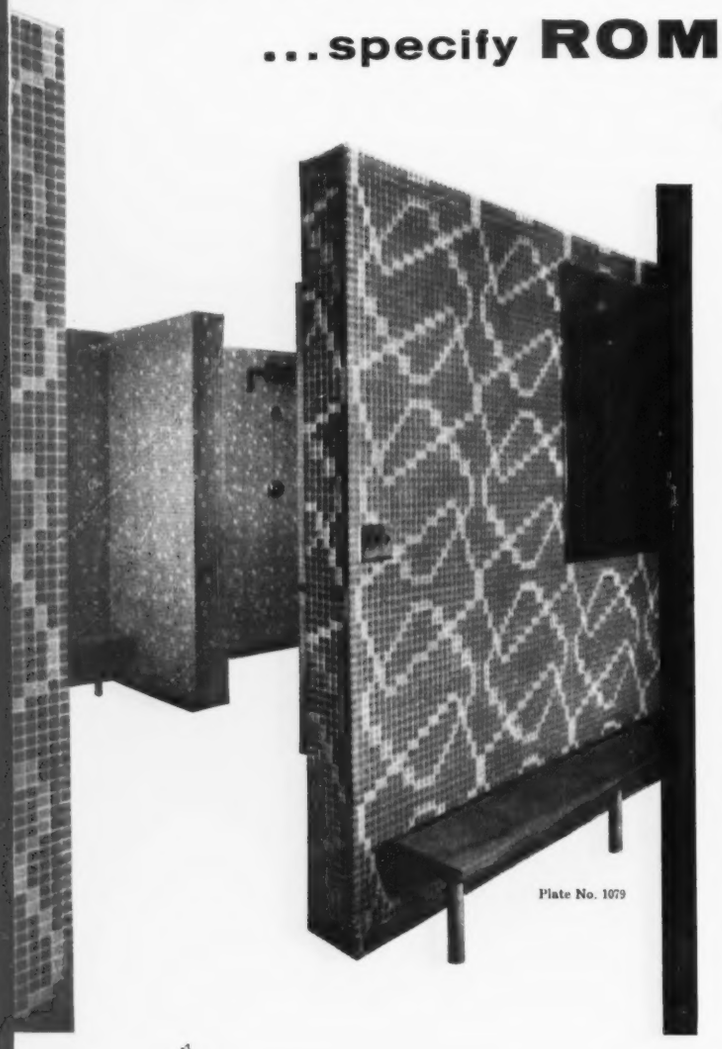

Plate No. 1079

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GREENFIELD HIGH SCHOOL
Greenfield, Mass.

Architect:
JAMES A. BRITTON, AIA
Greenfield, Mass.

Tile Contractor:
JOHN J. BANNON COMPANY
Springfield, Mass.

ROMANY SPARTAN

CERAMIC TILE

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BPA

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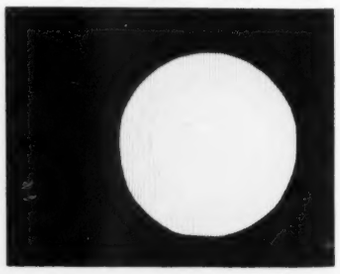
NEWS



This issue features illumination. Tony Palladino has taken the physical properties of light such as refraction, radiation, and diffusion and contained them within an iris-like design as our cover theme.

← Circle 100 for further information

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GAZETTE

Carl J. Aufderheide has joined staff, as estimator, of Standard Construction Co., Minneapolis.

R. M. Doering, PE, appointed chief power plant engineer at Albert Kahn Associated Architects and Engineers, Detroit.

Sylvan L. Hanauer, PE, appointed consulting engineer to Morse Boulger, Inc., New York City.

Herbert Rosenthal, Los Angeles designer, appointed chief exhibition designer for Century 21 World's Fair Exposition, to be held in Seattle in 1962.

Dr. Alan D. Franklin appointed chief of Mineral Products Div., *National Bureau of Standards*. He succeeds Dr. Irl C. Schoonover, now associate director for planning.

Albert Kahn Associated Architects and Engineers, Inc., Detroit, announce following appointments: Saul Saulson, director of mechanical engineering; G. S. Whittaker, chief of mechanical division; Charles Allen, PE, chief-heating engineering; Homer Yaryan, PE, chief-plumbing engineering; and Norton Taylor, PE, assistant chief-ventilating and air-conditioning engineering.

Dr. Paul F. Kerr, Newberry Professor of Mineralogy at Columbia University, awarded honorary Doctor of Science degree by Occidental College, Los Angeles, for contribution to national supply of uranium raw materials during World War II and for his fundamental contributions to the study of clay minerals and studies of the origin and emplacement of mineral deposits.

Arthur K. Howe, civil engineer, has joined technical service department of Sika Chemical Corp., Passaic, N. J.

William A. McAlister, Architect and Engineer, elected president of architect-engineering firm of Thomas J. Davis, Inc., following the affiliation of that firm with Engineering Service Corp., civil engineers, Los Angeles.

Dr. Raymond D. Mindlin, professor of Civil Engineering at Columbia University, presented "Great Teacher Award," by Society of Older Graduates of Columbia University, for a "distinguished career in engineering scholarship and research."

Henry Sleik, co-author of *Air Conservation Engineering* (1944), has retired from active participation in Connor Engineering Corp., Danbury, Conn. He will continue to serve as a technical consultant.

Board of Directors of Albert Kahn Associated Architects and Engineers, Inc., re-elected for ensuing year. Members include: George H. Miehls, Sol King, Sheldon Marston, G. K. Scrymgeour, R. E. Linton, G. S. Whittaker and V. C. Wagner.

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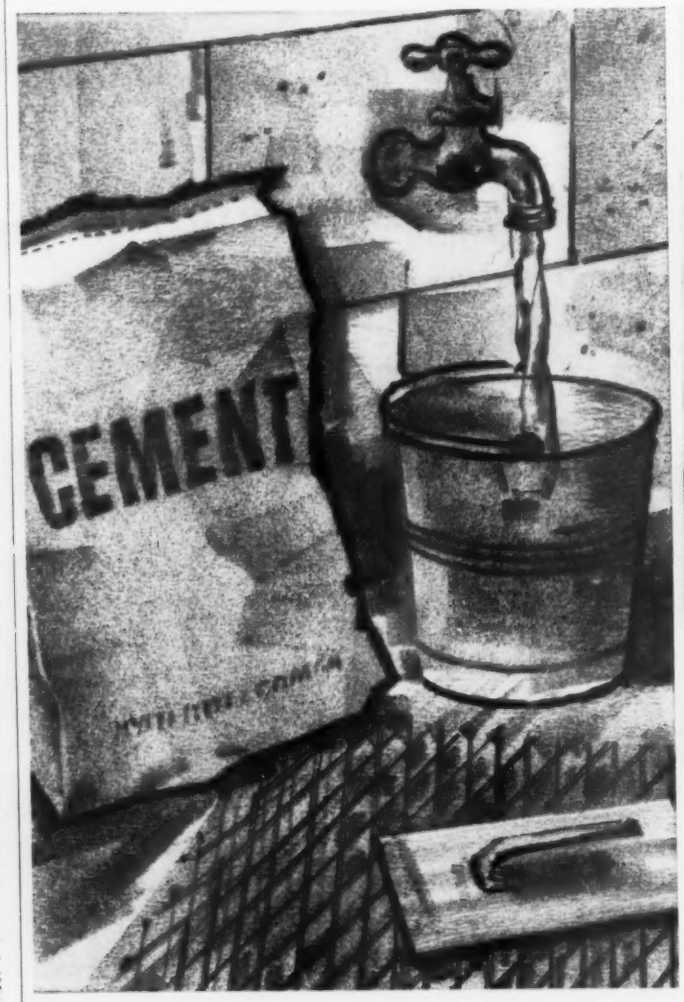

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new Armstrong Acoustical Fire Guard

kind of ceiling, can save your clients as much writers' Laboratories rated fire protection.

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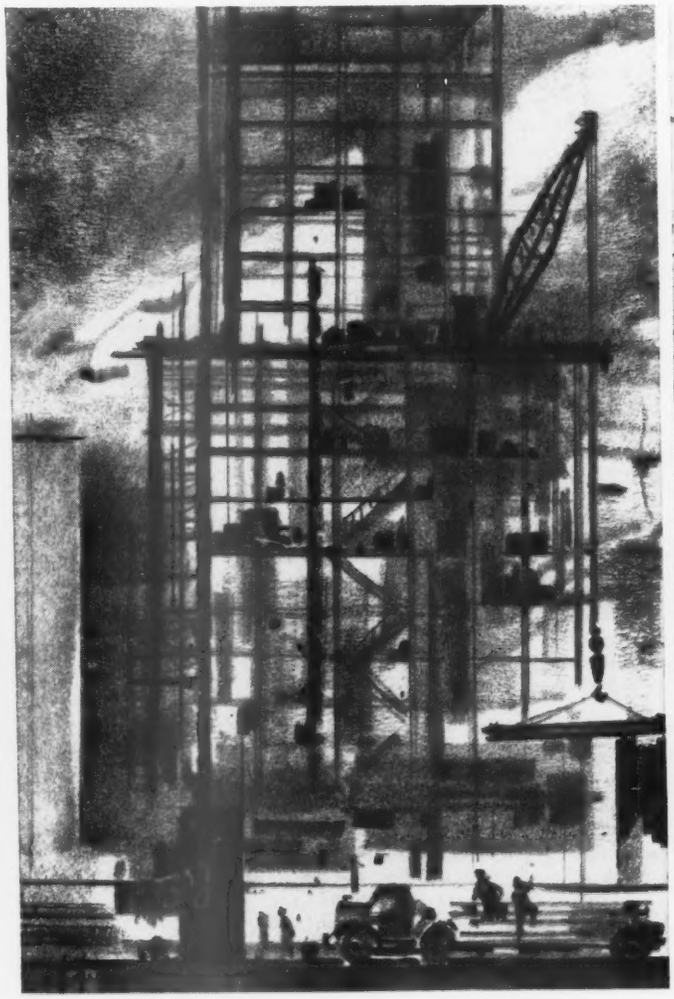

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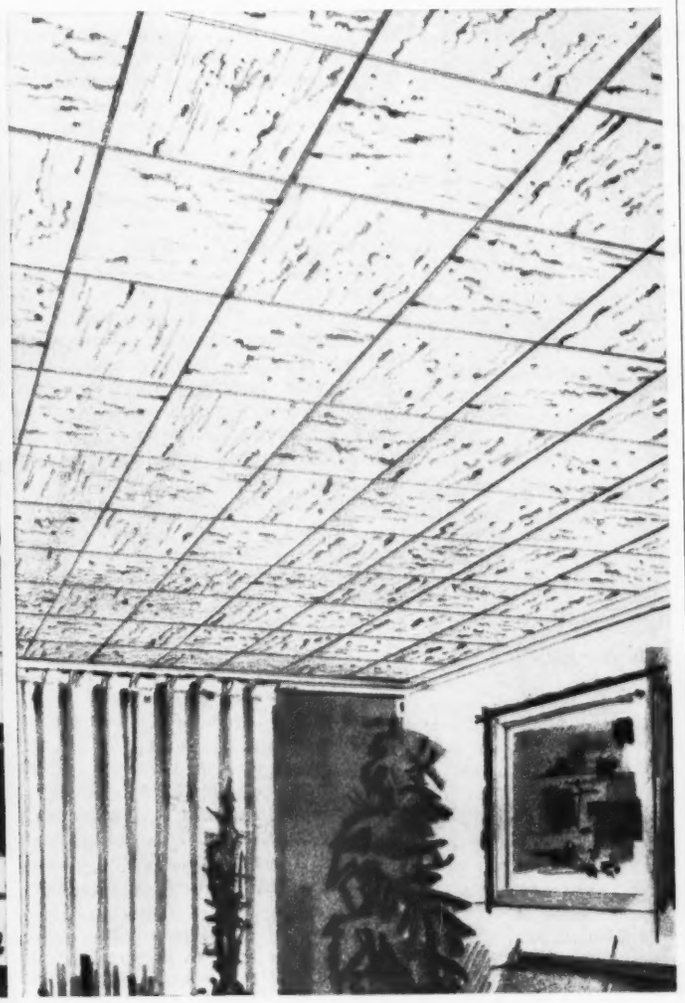

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GAZETTE

Following presentations were made at the annual dinner meeting of the Southern California Chapter, *The American Institute of Architects*. Student Awards: Award of Merit to Miss Ena Dubnoff of Los Angeles; Award of Merit and Special Award to Robert Jackson of Los Angeles; dual Special Awards to William S. Walsh of Glendale; and Special Award to Robert Kramer of Sherman Oaks. Scholarship award of the Women's Architectural League to Marvin Braxton Futrell of Los Angeles. Third annual Mentorship Award to John Spohrer of Gardena.

The officers of The Engineers Collaborative, consulting structural engineers, have announced that the firm of Wiss and Associates has become a part of their organization. Also, that Richard Elstner, 1955 winner of Watson Medal of *American Concrete Institute*, has become an associate member of the firm.

Giffels & Rossetti, Inc., Architects-Engineers, Detroit, judged winner of twenty-sixth annual design competition of *Factory* Magazine for 300,000 square foot, Royal McBee Corp. project at Springfield, Mo.

Charles G. Gable, AIA, has joined, as project architect, the staff of Charles Luckman Associates, Los Angeles planning-architecture-engineering firm.

Ten high school seniors awarded $1,000 scholarships in civil and architectural engineering, in eleventh annual scholarship program of *American Institute of Steel Construction*.

Wallace K. Harrison, FAIA, of Harrison and Abramovitz, received honorary degree of Doctor of Letters at Clark University (Worcester, Mass.) commencement ceremonies.

Niels C. Beck, assistant manager of program development of *Armour Research Foundation*, and director-general of the Union of Burma Applied Research Institute at Rangoon, chosen to explore possibilities of establishing scientific research institute in Afghanistan.

Office announcements

Opening of professional practice announced by Joseph Fuller, AIA, 103 Park Ave., New York, N. Y.

Friedman, Alschuler & Sincere, Architects and engineers, to 130 North Franklin St., Chicago, Ill.

Architects Ralph T. Rowland and Gordon B. Griswold announce formation of partnership, Rowland and Griswold, Architects, 5 Ives St., Hamden, Conn.

Elting, Deknatel & Associates, Inc., architectural firm, formed by Winston Elting, FAIA, and William F. Deknatel, AIA. Located at 25 East Jackson Blvd., Chicago, Ill.

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FORECAST

This FORECAST is a coverage of those statements that reflect some of the most advanced and intellectually mature ideas of our time and space within the architectural profession and the larger area of the society of man. These excerpted comments were delivered during the course of the professional sessions of the recently-held annual convention of The American Institute of Architects at San Francisco.

PARKINSON: *"after dark, are cities of the dead"*

"Here in the United States over fifty million people have come to live in what is neither country nor city. Having now had some experience of that life, I have come to the conclusion that the American suburbanite, trying to combine the amenities of city and country, enjoys the advantages of neither. The car and the television set are no real compensation for all that he has lost. In the one direction the urban sprawl has put the countryside (in so far as there is any) out of effective reach. In the other direction, the city's magnetism has been lost. It can no longer sell itself. It has little to offer that would balance the real inconvenience of returning there in the evening. This is not true of New York, nor of San Francisco, both of which owe much to the limiting effect of their shoreline. But how many cities would justify a tourist's pilgrimage from Europe? There are few cities worth visiting; and many, *after dark, are cities of the dead,* and a few relapse into disorder and chaos. The lives of millions have come to center on their suburbs, and very dull their lives are apt to be. I should add that the present one-floor style of domestic architecture may well have results that no architect foresaw. A new generation grows up without ambition; the children who had no stairs to climb at the age of two. A new generation grows up without courage; the children who had no bannisters to slide down at the age of six. Apart from that, the urban and suburban landscape now consists not merely of sprawling ranchhouses, for which there is no room, but of pylons, masts and poles festooned with connecting cables. The Japanese are in the same plight and their towns, like those in U.S.A., stretch on forever—stretch on, in fact, until some other town is reached. The urban sprawl which abolishes the city can abolish the countryside as well. Many American centers of population are difficult to recognize as cities at all.

"Now, I do not advocate a war against suburbia. Much could be done to improve the suburban way of life, and I trust that much will be done. What I do feel is that people should go to suburbia if that is what they like; they should not be driven there by the lack of any reasonable alternative. For the vital life of the city must go on if civilization is to survive. This is more often repeated than explained, but the explanation is in fact fairly simple. When the explosion occurs in the afternoon, projecting the city's daytime population into the suburban areas, each working inhabitant is taken from his professional world and deposited in a neighborhood unit. From Madison Avenue and Wall Street (each representing not merely an area but a professional atmosphere, as in London from Harley Street or Saville Row) each commuter is whirled into a different suburban world. He becomes, for a greater and greater part of the week—Friday to Monday inclusive plus each evening—one of the folks in the block North-East of Prospect and Vine. His neighbors are drawn from all trades and vocations and among them he may be the only journalist, the only banker, the only engineer. Up to a point it may be good for the banker to mingle with people who are not bankers. It may even be good for the professor to mingle sometimes with people who are not professors. But can the same be said with confidence of authors, artists, musicians and actors? The dangers are two. First, it is easy for me to be the best historian in a society which includes no other historian. Second, it is probably bad for me to confine my ordinary social conversation to such topics as grade-schools, gardens, gossip and golf. In such a life we are all dragged down to the intellectual level of the P.T.A. meeting. The greatest intellectual and artistic achievements do not spring from suburban lawns. There are poets who commune with nature in the lonely hills but the masterpieces of prose and canvas, the symphonies and ballets, are more likely to come from a harsher world of criticism and rivalry, from Shaftesbury Avenue or Fleet Street, from the Latin Quarter or from Pontparnasse. One man can be supreme only among many who are good. And what is obviously true of art and architecture is true, to some extent, of all intellectual life; journalism, medicine, science, history and law. . . .

". . . I would maintain that the revival of city life, as an effective background for intellectual discussion and constructive thought, is a thing of vital importance. I want to see the open air cafes fronting on the piazza (as they do in Venice), one known to be the haunt of poets, another devoted to the playing of chess, a third where photographers display their art. But the great piazza at Venice has no traffic! If I dared speak for the intellectuals and artists of the world, I should say to you architects: *"Ours is an age when the many rely more and more upon the abilities of the few. Give us a city in which we can live and work and argue and compete!"* . . .

From an address by
Dr. C. Northcote Parkinson
Raffles Professor of History,
University of Malaya,
AIA Panel on Political & Economic Horizons

BELL: *"problems of power"*

"Along with the recognition of American sociologists, and American intellectuals generally, of the problems of power in American democracy has come increased knowledge of human behavior. The science of sociology has made considerable headway in the last decade in codifying the principles of human behavior. We are no longer content to merely predict with an accuracy little better than chance the way people will behave, but we are becoming more ambitious and raising our sights to the formulation of the principles of controlling, of manipulating, people and their institutions. As a criterion of good knowledge, there is perhaps nothing better a scientist can expect than to control the phenomena with which he is concerned. In the case of the sociologist, such phenomena include certain aspects of the behavior and ideas of individuals as well as the patterns of social interaction which characterize the way individuals relate to one another. If sociological knowledge is good—that is if it really works—the conditions have been created to control or manipu-

late the behavior and thoughts of others. However, the knowledge itself can be used to achieve many purposes. Like the principles of atomic energy which may be exploited to help to build a city or fry it in destruction, the principles of sociology—once they have been sufficiently developed—may be used to create the conditions under which our ideals of democratic controls may be more fully achieved or they may be used to increase the concentration of power in the hands of a few oligarchs and make a sham of our democracy as we now think of it. It is not just that a political candidate today can be packaged with more effectiveness than a tube of toothpaste or a cigarette could be last week, but it is that we are learning techniques of organization and control which make our political process—our institutional guarantees of political democracy—increasingly irrelevant to the actual decision-making regarding the important issues which affect our lives. It is ironic that among the men of a single discipline there are simultaneously a growing fear of the potential abuses of social power, and an increasing success in developing the knowledge which makes the outcomes of the exercise of such power more certain. Or perhaps it is not ironic at all but completely understandable. Because while the average citizen remembers sociology as a kind of joke—a set of relatively unsophisticated common sense statements about everyday life, or some absurdities about marriage and the family, or unusual views on sex—sociology has been changing markedly. It has become research-oriented, more rigorous and more imaginative, more precise and more theoretical, more exact and more widely applicable. And the sociologist, of course, has been more aware of these current trends than the public at large. The future can only hold a continuation and further elaboration of these developments. . . .

"Thus, since the early part of the 20th Century there has been a discernible shift in the attention of sociologists from the problems of social disorganization to the opposite—the problems of power. At the same time recent developments in sociological knowledge potentially permit greater prediction of and control over human behavior than formerly. And the theoretical commitments of sociologists have moved from the notion of immutable and impersonal causes about which man could consciously do little to control and have moved to the notion of the efficacy of conscious decision-making and the control of some men by others—factors which man can control by conscious effort. . . .

"The problem of power is not simply that it is concentrated. Every society if it is going to constitute anything but anarchy has to have some organized power. Different functions must be allocated, different social roles having different degrees of responsibility and control over others must be created and filled, some form of social organization, however rudimentary, must exist. The fact of power, then, and even its amount of concentration is not the crucial social problem—except perhaps in those cases where there is insufficient concentration of power to achieve the goals of the society and its members. . . .

"I have, of course, been speaking to you as citizens, not as architects. My point in bringing a few facts about one aspect of American democracy to your attention is to engage you in what, I think, must be a continuing dialogue among citizens of a free country about the state of their practical affairs as viewed from the perspective of the values they profess. Without such a continuous dialogue, based on examination and reexamination of both our real situations and our principles, we may be in danger of never achieving the American dream of freedom and equality for all men which is forever before us on the horizon."

From an address by
Dr. Wendell Bell
Professor of Sociology & Anthropology
University of California (UCLA)
AIA Panel on Sociological Horizons

OPPENHEIMER: *"enhance the beauty of its inward, inner quality"*

"For tradition today is not only the maintenance of our root, it is the very instrument by which we render it obsolete. It is the basis on which discovery is made and therefore the basis of all the upsetting of tradition, good and bad, which the sciences have brought.

"And this of course means that there are between the sciences, between sciences and the fine arts, between all of these and the general public, enormous synopses of communication.

"There is aplenty of unity in this diversity of the sciences as there is also some unity and some analogy between the sciences and the arts. *Perhaps the strongest unity is that all creative work, all creative men recognize a kind of analogy in the human aspects of the creative process, in the terror, in the discipline and the essential loneliness.*

"With the sciences there are also of course, other elements of unity, a total absence of contradiction from the most minute particles of matter to just beginning, hardly beginning, to identify and understand, to the remotest regions of space, so far away that it takes light billions of years to reach us from it, from the deadened, inert matter of physics to the living matter of plants and animals and men; from the uninformed behavior of disorganized matter to the most subtle, coded information-behavior of living and even conscious creatures.

"This unity, this absence of contradiction is very real. But it is not the kind of unity that has any hierarchal monistic traits. . . . It is a manifold diversity connected in a kind of tolerant, multiple connectedness, a connectedness much of which is not realized but all of which is potentially there.

"And, of course, there is for the life of the scientist as even more for the life of the artist this essential feature of creativity, that although nature tells us what is not true it does not tell us what questions to ask, it does not tell us what ideas to use, it does not tell us what experiments to devise, it does not tell us where to look or how to look for the truth, and we find the same choice that a painter does or a musician, which is that the search for truth is an action, involves choice and is therefore also very partial. And if we deal on the basis of our tradition, our taste, our sense of human destiny, our style, we deal with nature in a way which tells us very much about what there is to know but inevitably in the nature of things, as is illustrated in the very content of the sciences, our search for knowledge always denies us knowledge, our search for knowledge is always partial, the world of knowledge is always in an obvious way open and the quest for knowledge in an equally obvious way infinite.

"It has led us to think that the objective character of what we learn in science lies not so much in ontological or metaphysical characteristics but rather in the way we can talk about it, with a kind of almost total lack of ambiguity between us so that we can check up on each other, can do what another did, can find what another found, and decide whether it's right or wrong.

"This is important because there are many parts of human life in which such criteria of objectivity are much harder to apply and without which we cannot really live as men.

"Now if it is true that between the sciences and among us communication is difficult, limited, if it is true that with us *re-education is a continuous process or we stop being educated at all,* it is clear that the problem of the relation of this vast accumulating and interesting and beautiful knowledge to the people who are other sorts of people, lawyers, farmers—if there are any farmers—people at large, political leaders, the sources of power whom you heard yesterday, the disconnection will be very much more difficult indeed. And if there is a kind of alienation between worlds of high intellectual achievement so largely limited to the sciences in their broad sense, in their all-inclusive sense, and the public world, the public sector of our lives, the common discourse in which all men live. And for this reason we have noticed in this century that the greatest discoveries in science have, for the most part, hardly been understood and hardly seemed relevant to the general thinking of men—Darwin certainly did—in physics in this century we think we have found things which shatter our image of human knowledge as profoundly as any discovery ever made, but very few people know about it and our attempts to make this part of the common discourse have not on the whole been successful. The thinking caps of men change, but today the contribution of the high intellectual enterprise of discovery to this change is not very robust, not very honest and not even a very existing one. . . .

". . . For this public sector and for this common discourse which the arts have characteristically lived and which they have made possible and enriched, for this there are many pre-conditions, one—and it's important—it is a common basis of knowledge. And what has happened to that? I think I have indicated. One is a shared tradition and a certain slowness of change so that the past is meaningfully present in the present and meaningfully relevant to the future. . . .

". . . It seems to me that the greatest hope I can express for your profession is that you will find it possible in your work of design and creation to look with very wide angle lenses at the site in which you are working. Ideally, perhaps, the city itself, the megalopolis or the province and perhaps, not rather in the way we can talk about it, with a kind necessarily ideally only, perhaps in reality, anyway at the very least in areas physically large enough to encompass what naturally meets the eye, what one sees in one vision. I think that this may promise the possibility of doing justice to the unique and intimate in the structures you design, that which makes them unlike any other, that which makes them works of art fit for their purpose at the same time that it bears a physical mark of the actual multiple relatedness of human institutions and of human lives, and that in recognizing this relatedness one will not lose but enhance the beauty of its inward, inner quality."

From an address, "The Houses of Science"
by Dr. Robert Oppenheimer
Director, Institute for Advanced Studies,
Princeton, N. J.
AIA Panel on Technological Horizons

(ABOVE) View of Christ Chapel, Episcopal Academy, Overbrook, Pa., $400,000, 600-seat worship center. Design is based on Greek cross plan, with three transepts and a choir radiating from a central altar. Main portal, executed in Chartres, France, which depicts nativity scene, is vignetted upon clear glass background to permit maximum use of natural light. Architect: Vincent G. Kling, FAIA, Philadelphia, Pa.
(LEFT) Rendering of $16 million, 24-story, La Salle-Jackson Building in Chicago, scheduled for completion in late 1960. Structure's exterior will be of heat-absorbing gray glass curtainwall construction, with aluminum mullions spaced between columns clad in white marble. Street level plaza and pool will occupy the 34-foot setback. Gross area is 638,000 square feet, with net rentable area of over 500,000 square feet. Architects and Engineers: A. Epstein and Sons, Inc., Chicago, Ill.

Model of $2.3 million, 11-story, Temple University Men's Dormitory, first of two such units in the University's $50 million campus expansion plan. Scheduled for occupancy in September, 1961, the masonry curtain wall structure will house 450 students and 10 proctors, providing a dining room, kitchen, lounges and recreation areas. Informal garden is used to achieve open effect in an otherwise densely populated, urban area. Edifice has been awarded "Citation for Excellence" by Philadelphia Chapter AIA. Architects: Nolen and Swinburne, Philadelphia, Pa.

AIA portfolio

Philip Will, Jr., FAIA, newly-elected president of *The American Institute of Architects*, declared in San Francisco, that his administration will seek to "establish policies aimed at insuring that architectural practice will both anticipate and keep pace with a rapidly expanding economy, a mushrooming population, a fantastic consumption of land and a resultant building need which dwarfs anything ever undertaken in the past.

"This new architecture, no longer confined to single buildings or even complexes of buildings or neighborhoods, is expressed in a new concept of integrated community design," Mr. Will said. This, in turn, flows out of "new and genuine public awareness of the need to plan the development and redevelopment of our nation's physical environment without delay." At the same time, he said, it springs "from a new heightened level of public taste."

Mr. Will is a partner in the Chicago architectural firm of Perkins and Will. He was unopposed for election as president of the AIA in balloting conducted on April 21, at the Institute's 92nd annual convention, held in San Francisco.

The candidacy of Henry L. Wright, FAIA, of Los Angeles, Calif., for the position of the Institute's vice-president was also unopposed. James M. Hunter, FAIA, of Boulder, Colorado, won a three-way contest for the office of second vice-president. Raymond S. Kastendieck, FAIA, of Gary, Indiana, was re-elected treasurer in another election contest. J. Roy Carroll, Jr., FAIA, of Philadelphia, Pa., was unopposed for his second term as the Institute's secretary.

Over 2,500 architects from all over the United States met in San Francisco; the attendance at this convention was considered by AIA officials to have surpassed all previous meetings with the sole exception of the 1957 Centennial Celebration in Washington. The theme for this past convention was "Expanding Horizons." Prominent speakers on sociology, technology, politico-economics, and philosophy explored the trends in their

fields and a panel of architects related these trends to problems which the architectural profession must anticipate.

This portion of the program was introduced by Mr. Ralph Winfred Tyler, Director of the Center for Advanced Study in Behavioral Sciences at Stanford University.

The talk by sociologist Dr. Wendell Bell, professor of Sociology and Anthropology, of the University of California at Los Angeles, stressed the role the "power elite" play in American life today. He was followed by architects Harry Weese of Chicago, Ill.; Henry D. Whitney, New York, N.Y.; and William W. Wurster of Berkeley, Cal.

Dr. J. Robert Oppenheimer, Director of the Institute for Advanced Studies, Princeton, spoke on "The Houses of Science." His discourse was discussed by a panel on "Technological Horizons," consisting of architects O'Neil Ford of San Antonio, Tex.; Burnham Kelly, Cambridge, Mass.; and George Fred Keck of Chicago, Ill.

Discussing Cyril Northcote Parkinson's address on "Political and Economic Horizons," were architects Walter Andrew Netsch, Jr., of Chicago, Ill.; Maynard Lyndon and Robert E. Alexander, both of Los Angeles, Cal. Parkinson is the author of *Parkinson's Law, The Law and the Profits*, and a history professor at the University of Malaya.

Debating the issues on "Philosophical Horizons," presented in an address by Dr. Morton White, Professor of Philosophy at Harvard University, were architects Lawrence B. Anderson of Boston, Mass.; Louis I. Kahn of Philadelphia, Pa.; and John MacL. Johansen of New Canaan, Conn.

Mies van der Rohe, FAIA, world-renowned architect, received the AIA Gold Medal at a dinner ceremony. Other awards went to architect Philip D. Creer, photographer Roger Sturtevant, artist Thomas Hart Benton and silversmith William DeMatteo.

Also presented were the Homes for Better Living Awards, the R. S. Reynolds Memorial Award, Honorary Fellowships, Honorary Memberships, the Allied Professions Medal, and citations to organizations.

An important convention feature was the exhibition of new building products which this year included 91 different product exhibits.

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(Continued on page 8)

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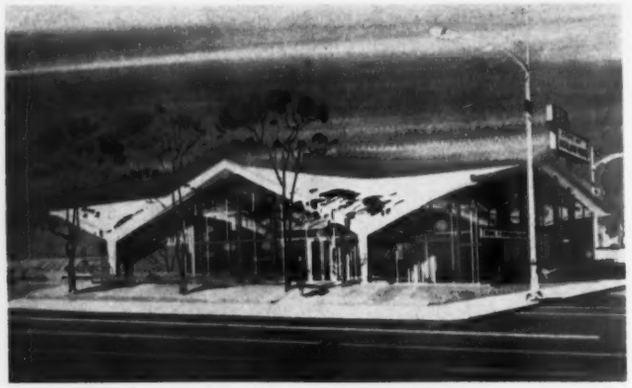
Architect's model of proposed first phase of ten year, $15 million construction program for Hahnemann Medical College and Hospital provides for clinical research building, surgical pavilion and student nurses' residence and classroom building. Other construction will include medical college building, resident and intern residence, outpatient clinic and patient pavilion. Architects and engineers: The Ballinger Co., Philadelphia, Pa.

Geodesic space frame to house storks, cranes and other birdlife constructed for Anheuser-Busch, Inc., as feature of Busch Gardens, Tampa, Fla. Fabricated of gold anodized aluminum tubing, it is 99 feet in diameter, 20½ feet high at its zenith and encompasses a 7,700 square foot area. Cost, including landscaping, walkways and lighting, is $75,000. Designed by Graver Tank & Mfg. Co., Div., Union Tank Car Co., East Chicago, Ind.

A|E NEWS

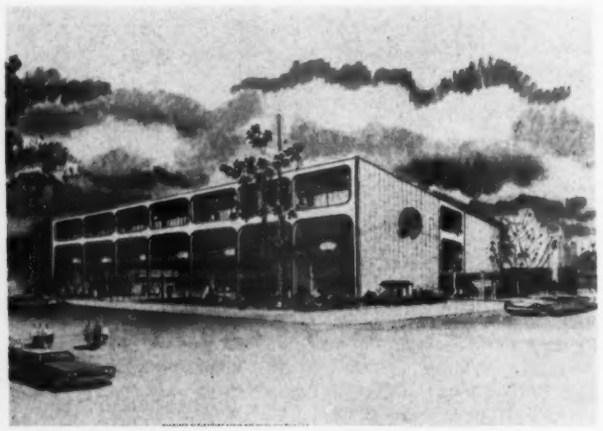
(Continued from page 7)

"Ascension," created by William Zorach as symbol of R. S. Reynolds Memorial Award for creative use of aluminum in architecture.



Bank of Highland Park, designed for motorist bankers, will be constructed in Highland Park, Ill. Structure will feature 3-inch hyperbolic roof of concrete, supported on four exterior columns. Expanses of glass comprise exterior walls to provide view of interior to passersby. Architects and engineers: Friedman, Alschuler & Sincere, Chicago, Ill.

Plans announced for $2.3 million, 3-story, 85,677 square foot Theatre Arts building for University of California, Los Angeles for completion early in 1962. It will contain two theaters, dressing rooms, large construction area for use in designing, assembling and storing sets, sound and control rooms, rehearsal halls and offices. Architects: Charles Luckman Associates of Los Angeles; William L. Pereira, consulting architect and Coulson Tough, project architect.



Featuring authentic Japanese restaurant and garden, a department store, owned by the Japanese Seibu Corp., will be erected in Los Angeles. Containing over 100,000 square feet of space, the store will handle only quality merchandise from Japan. Multi-level parking lot for approximately 550 cars will be included. Completion date is August, 1961. Architects: Welton Becket & Associates, Architects and Engineers of Los Angeles, New York and San Francisco.

sue to arise as convention business was the consideration of the AIA Board Committee on Structure's recommendations for the structural reorganization of the Institute. After discussion, the convention voted to expand the Committee on Structure so that it represents all regions and to instruct the new committee to study the current proposal as well as other proposals, and report its recommendations to the Board of Directors so that action may be taken at the 93rd convention.

Novel SA tour open to architects

A specially prepared, 17-day tour, exclusively for architects, to four countries—Brazil, Peru, Ecuador and Colombia—is jointly announced by A/E News and IVA, the Inter-American Visitors Association. The IVA program is to facilitate the exchange of professional groups between the Americas and to stimulate greater mutual understanding and better economic and cultural inter-American relations. The group, which is limited to only 15 architect-participants (including wives) will visit key cities, attend luncheons, banquets, receptions, seminars and special events given by government officials, business leaders, architectural societies and social clubs. First class (regular carriers) air transportation (to and from NYC), insurance, limousine transfers, gratuities, first class hotel accommodations (double occupancy) with Continental breakfast, special reception plus other features are in the program. Tour will receive wide press, radio and TV coverage. IVA's coordinating efforts makes cost of tour, per person, only $975, representing a 30 per cent saving. Travel arrangements are by established and reputable agencies. Chairman of the group is Mr. David W. MacCurdy, of Voorhees Walker Smith Smith and Haines, New York architectural firm. Tour dates: from August 12 and return August 30, 1960. Inquiries should be addressed to: Inter-American Visitors Association, Inc., 15 West 46th St., New York 36, N.Y.

CEC/NSPE news

Chairman Alfred Samborn, PE, has disclosed that the feature speakers at the Annual Functional Section of the *National Society of Professional Engineers* were Representative Gordon B. Scherer, ranking Republican member of the House Roads Subcommittee, and Arthur W. Lewis, counsel for the New Jersey Society in the

pending litigation on jurisdiction between architects and engineers in the McCamy case. Elsewhere on the agenda were reports of the activities and programs of the various executive and regional committees of the NSPE. All consulting engineers were invited to attend the all-day session, June 10, at the Statler-Hilton in Boston, Mass.

Consulting Engineers are finally "on the record" following appearances during the month of April by *Consulting Engineers Council* president, Ralph M. Westcott, before two congressional committees. Meeting April 12 with the Public Works Subcommittee of the Senate Appropriations Committee, and April 13 with the corresponding House committee, the Council president, accompanied by Highway Committee chairman, L. K. Crawford, presented strong arguments in favor of the use of Consulting Engineers on public works projects.

Calling specific attention to last year's Report 424, which accompanied the Public Works Appropriations Bill for fiscal 1960, President Wescott expressed concern over recommendations that the government consider reducing the use of private engineering services. Referring to U.S. Consulting Engineers as a "great reservoir of engineering strength upon which the nation has twice called within the last two decades," Wescott pointed out that any efforts to cut down this potential may lead to serious consequences in case of future national emergencies.

Issue was also taken with recent statements which have urged a massive build-up of public engineering staffs. Arguing that, in most cases, such increases are unnecessary, except to handle specific problems or temporary work loads, the CEC president suggested that far more flexibility could be obtained through use of consultants to handle peak loads. Principal attention was given in the course of the CEC testimony to the relationship between costs on public and private engineering projects.

Research notes

The U.S. Public Health Service has awarded the first grant ever given to a chapter of *The American Institute of Architects*, it was announced by James Souder, AIA, Chairman of the Hospital and Health Committee of the *New York Chapter of the American Institute of Architects*. The grant is being made for hospital design research.

The research project, which will cover a three-year study of the planning of hospital operating suites, will be directed by Robert Hyde Jacobs, Jr., AIA, who plans to set up an office for the project in New York City early this summer.

The project was formulated by the Hospital and Health Committee, through its sub-committee on research headed by Harold Olsen, AIA. The project's work will include an intensive investigation of routines carried on in operating suites, a survey of work being done in combatting hospital-acquired infections, insofar as this applies to the layout and equipment of operating suites and an analysis of existing and projected operating suite plans, with the purpose of developing information to help hospital architects.

Competitions/awards

The coveted $5,000 Lloyd Warren Fellowship—the Paris Prize—has been awarded to Lloyd Guy Walter, Jr., of North Carolina State University. The highly-regarded student award in architecture is awarded as a result of a national competition by the *National Institute for Architectural Education*. Mr. Walter is the 47th winner of the Paris Prize in Architecture. His design for a "Theme Center" for the 1964 New York World's Fair was selected from 28 entries. The first alternate award of $500 was given to Bernard N. Steinberg, associated with the firm of Sherwood, Mills and Smith of Stamford, Conn. Mr. Steinberg attended Cornell and the University of California. The second alternate named was William E. Valentine also of North Carolina State. Five regional awards of $100 each were also given.

The Franklin Delano Roosevelt Memorial Competition has attracted unusual interest among this nation's architects. The recently-announced competition is a two-stage program, open to registered architects or to associations of others, provided a registered architect is part of the design team. All contestants must be U.S. residents. The second stage will be limited to only six contestants selected by a professional jury. Each of the six finalists will receive $10,000. Prize for the second stage winner is $50,000. More details may be had from Edmund N. Bacon, Professional Advisor, FDR Memorial Competition, 108-112 Tariff Commission Bldg., Washington 25, D.C.

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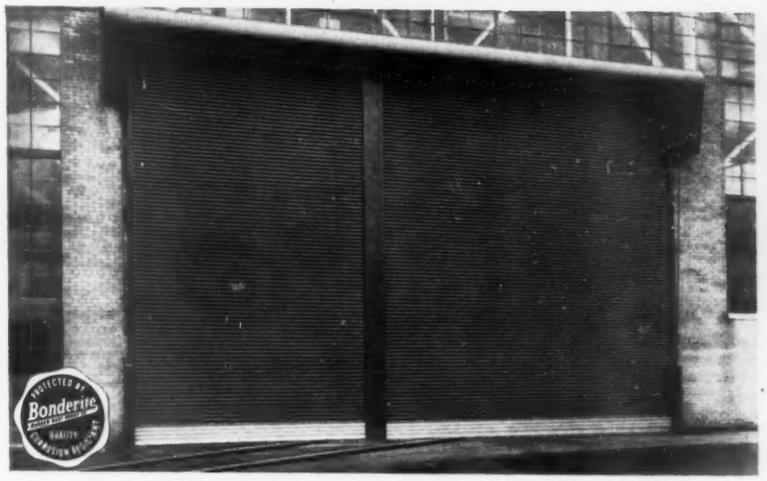

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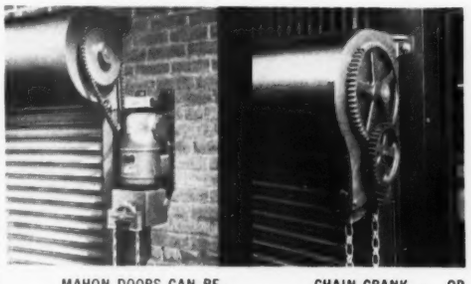

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LIGHTING: A Provocative View

by Abe Feder

Abe Feder [illegible] introduction as a designer of unusual lighting projects. His professional activities range from the lighting of the internationally-successful smash hit, "My Fair Lady," to lighting of the United Nations Building in New York. With hundreds of Broadway plays and musicals, and his consultation to architects on countless religious, commercial, public, recreational, institutional, and hotel buildings to his credit, he presents his own provocative views on lighting for architecture.

When you walk right through something without the slightest interference, everything within you says that what you've walked through is a "nothing." In this way, we have learned to define darkness negatively as the absence of light, because we cannot visualize it. But the definition of light, for most of us, is equally negative—i.e., *the absence of darkness*—since again we seem able to visualize it only negatively. How many of us could recall the qualities of the light we walked through last night? Yet, if the layman can afford to forget the qualities of light and remember only the impression they made possible, the architect cannot. The architect may realize a building faithful to his original design but he may also destroy it by the manner in which he lights it.

Why standards?

Why does the architect turn to standards—that parade of fluorescent boxes, the glaring downlights, the harsh bulbs that turn skin tones green? Perhaps, it is a lack of a trained visual sense of light that is partly at fault. If he is one of the very few who has had at least an introduction to the problem, it usually has been an introduction to *illumination* rather than light. He has learned about levels of illumination, reflectance factors and the like, but he has never been taught to look at light patterns in space, to observe what occurs in space when the light, filling it, changes, and also to observe the effect of different kinds of light on the people who live within this space. In other words, he has not been taught to *see* light, to separate it from the objects it illuminates and recognize it as a *material*. Accordingly, he can hardly

be expected to visualize *the kind of light each situation deserves*, and therefore, he cannot be expected to be able to *design with light*. He has had an introduction to illumination—the absence of darkness—but not to light itself. His answers to his lighting problems have to be ready-made, since he has no other recourse.

There are other pressures too. The architect, all too frequently, is given the problem of creating as much rentable square footage as possible on a given plot, with the familiar limitations of a stated budget. He feels he can't afford to dream, and unfortunately, what isn't "standard" today, often seems like dreaming. Besides, there is the air-conditioning load to worry about, and the ducts and pipes in the ceiling—and only shallow ceilings are economical. Then too, there is the community in which the architect is also a fellow human being and which desperately is trying to look like every other community—*only better*. "Better" in this sense means *more of the same*. It seems only natural to keep refining the box *ad infinitum*, and competing in the lobby and the plaza areas only. If the architect feels he has lost his individuality—so have his clients. And if he builds in modules, it is no wonder that the architect also lights in modules, increasing or decreasing the number of fluorescent boxes and downlights in accordance with illumination demands. Any fixture or lamp manufacturer is happy to take the lighting problem off the architect's hands, and in my opinion, frequently does. It is a case of the tail wagging the dog, but a critical situation in which the architect may not know that he is surrendering an important design prerogative when he accepts a "catalog" approach to his lighting problem. No one complains. It's easier that way.

Light is the one material which can fill space without obstructing it. The architect builds around the inner space, leaving room for people and their possessions. But whether he plans it or not, that inner space takes on a character from the light that fills it. The structure is only the perimeter of a building, and people live and function not on the perimeter but in its interior. That inside, when in use, is filled with light of one kind or another. In fact, light is the place where living goes on.

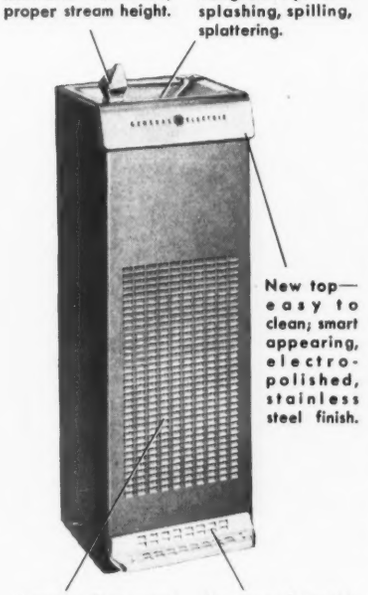
Illumination vs. light

The modular or mechanical approach may work for wiring, or drainage, or heating and cooling, but not for lighting. People, as such, are a concern here and I think we have to go on believing that they are important. How light is laid out in space, and how an object is placed in that light, determines how much that object is seen by people and what their functional and emotional reactions to it may be. This is more than a problem of brightness levels and ceiling heights:

(Continued on page 12)

A feature-by-feature review of General Electric water coolers shows it pays to . . .

LOOK BEYOND THE OBVIOUS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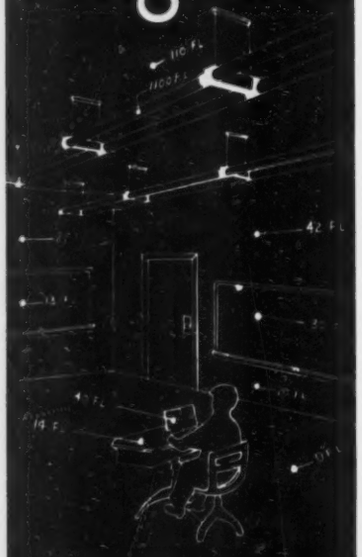

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LIGHTING

(Continued from page 11)

this is a problem of intensity, of diffusion, of focus, of contrast, location, spread, accent, and—of people. Accordingly, this *is* the problem of light.

Lighting economics

Strangely enough, a standard lighting design, that is, design by statistics and catalogs, is not necessarily an economical one. There is the question of that parade of fluorescent boxes and downlights, the constant increase in the number of lamps in order to increase brightness, and the large number of outlets to which wire must be brought. There is the question of efficiency: of lighting the ceiling and the walls instead of the inner space; of paying for the light that is bottled up inside a fixture and can't come out; of having plenty of illumination and somehow still having to add desk lamps in order to see. There is the question of the future: maintenance measured in man-hours and the electric bill; the fading of draperies or paintings and the like; the lighting design which is so quickly out-dated that the restaurant or the gas-station has to undertake a costly re-wiring job within a comparatively few years. And there is the question of identity: if my new store is going to look like every other new store, why do I think that customers will buy my goods instead of theirs? So often lighting with catalogs is accepted as the cheapest solution. But the owner keeps paying for the cheap solution as long as he has to live with it.

By turning over the responsibility of lighting to mechanics and catalogs, the architect turns over his design as well. He has chosen his materials and finishes as having the most affinity with his overall design intent, and as the best means of expressing the structure he has drawn in space. But since we see nothing, except through the medium of light, he defeats himself by his dismissal of the light in which his building and its material and finishes will be seen. The green in a fluorescent lamp can turn a subtle-yellow wall to a "muddy" color, and the careful detail on a column is lost when no one can see it.

Nor is the "fixture-first" approach the most aesthetic solution to lighting. Beautiful lighting is inherent in the light itself and not in the fixture or the colored bulb. Even a beautiful fixture can produce an ugly light. Light is the setting in which everything is seen, and if it does not enhance the people or the objects, if it distorts colors and perspective, if it makes the atmosphere of a room harsh, it is hardly beautiful.

What substitute for standards?

What we need to do is to forget our calculations and budget and take a good look at the inner space. What will people be doing here, in this particular room? What kind of light is both comfortable for these people to move in, and usable where the necessary objects are concerned? What is the architectural intent of the room? What *are* the aesthetic problems involved? What are the purely structural problems? What is the sense of size of this inner space: do we want to make it seem more spacious (a constant problem today), or do we want to bring the walls and ceilings in somewhat closer? These are only some of the questions to ask oneself before filling in that inner space. A catalog, by itself, can't answer them. Instead of being concerned with the electrical system, we should be concerned first with the problem of relating light to this specific inner space.

We don't turn to fixtures next. They don't produce the light, but the lamps they house do. There are three main types of lamps in use today: fluorescent, incandescent and mercury. But within each type is a wide variety of lamps, differing in intensities, beam patterns, color, life, sheer power to project, shape, etc. Which one to choose? This means a knowledge of lamps, what each can do and the differences between them.

For example, let us examine the hat shop. Immediately, we have to put women into this selling environment, almost *before* the hats. This means that the lighting must be inviting, and it means that the lighting of every type has to be flattering to skin tones. We need an even, general lighting so that the women can see to move about. For accent points, we need beams of light intense enough to cover a hat without spilling over onto the next hat. In this way, different styles can be featured each week. The shop also needs mirror lighting, but located in such a way that a customer's face is not in shadows when she tries on a hat. Where should the light sources, the lamps, be located? Let us say, that in this case, because of the architectural character, the ceiling has to be kept clean; perhaps then, the general lighting should come from sources set in a cove around the walls. The lamps for accenting the featured hats can't go into the ceiling, and for aesthetic reasons, they don't belong on the walls. They have to be recessed, and structurally, they can go only into certain walls. This then will have to determine where the featured hats will be placed.

The hat shop is an over-simplified example, but the moral of the story is that even before turning to lamps, we have to specify the types of light we need. Piece by piece, overlaid on the inner space, the lighting is brushed in. Only then are the lamps chosen. Each type of light is matched to the lamp that comes nearest to producing the desired effect. Here's the point at which the calculations may be permitted to enter the problem.

Light is the material for lighting, nothing else. But since we cannot handle it directly, we keep control of our material only with an exact knowledge of its sources. Fixtures are secondary. They are chosen so that they work with the lamps and not against them, to intensify the effect the particular lamp produces, without waste or glare. That fixtures in themselves should be attractive is obvious, but the essential fixture problem is to keep them unobtrusive, to keep them from becoming important in themselves, distracting to the eye, unless such an effect is a deliberate part of the architect's intent.

Light sources haven't changed very much since Edison's first electric light bulb. Light remains bottled up in glass housings attached to sockets, attached to plenty of wire. It is true that many varieties of lamps have come into being since, but each new lamp, however ingenious, is still an inflexible tool, designed to produce light in a very specific pattern and no more. When we consider the infinite flexibility of light as a material, and the inflexibility of its sources, we realize that the principle of producing light has not changed.

Tomorrow, light sources may be entirely different from those of today. Perhaps, in the future, each building, will have its own sunlight storage tank—its own solar energy supply. What use will the fixture catalog be if we no longer need lamps? I can imagine a downlight can or two hung up for the sake of nostalgia, but light will run riot and out of control, unless the architect has learned to work with light itself before considering its annoying appendages.

Place of lighting in architecture

It is obvious that the physical requirements for lighting will determine a good part of the structural details. If the structurals are set before the lighting is designed, it becomes uneconomical to change them to meet the needs of the lighting the architect should have.

But the timing of the lighting design is more basic than that. When the initial concept of how the structure is to divide space is determined, lighting has to come into the picture. There is the problem of area. The building separates the outer space from the inner space. Is this a building which the architect is willing to lose at night, or does he want it to be visible all the time? This means some kind of floodlighting. Does he want his building lighted from the exterior or the interior? If from the exterior, has he provided any dramatic points on the facade or skin to be accented? If he cannot afford this, can he leave the lobby visible and provide dramatic lighting effects here in order to compel the eye? No dramatic situation can exist at night without light, so that at least the building may be seen. If the architect uses every possible square foot of the plot, can he offset this effect with lighting to

(Continued on page 56)

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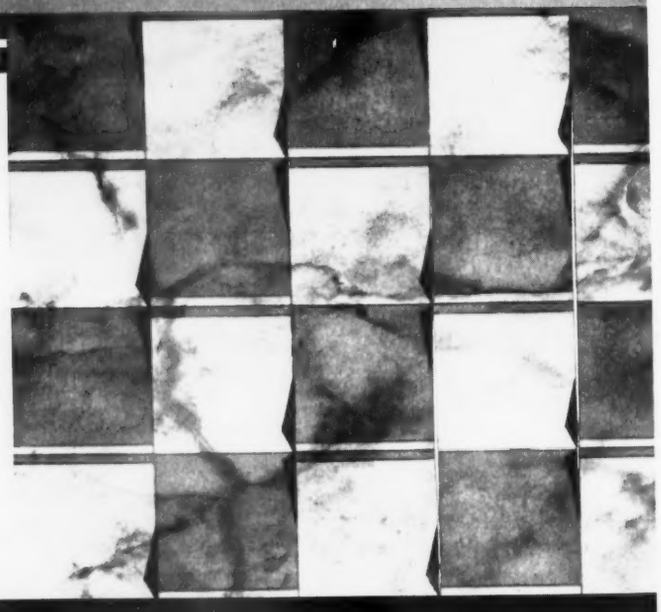

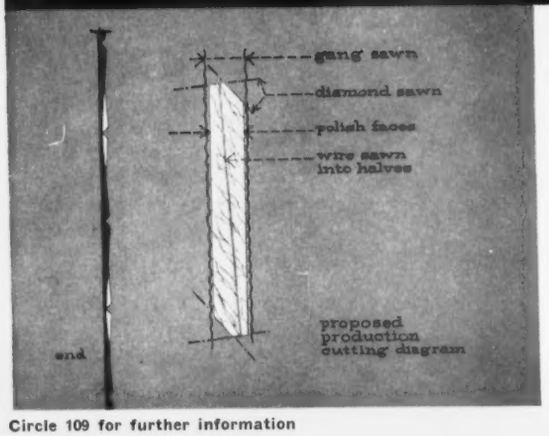

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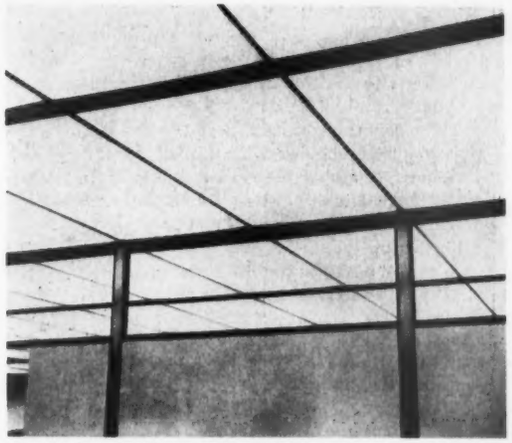
UCC'S Integrated Ceiling System



The Union Carbide Corporation's new office building in New York, features among many elements, an integrated acoustical-illumination system utilizing a lower power consumption for a high efficiency in lighting. Architects: Skidmore, Owings and Merrill; Structural Consultants: Weiskopf and Pickworth; Mechanical and Electrical Consultants: Syska and Hennessy. (Photo above) Plastic diffusers form plane of contiguous fixtures. Ceiling provides minimum of 50 foot-candles of light at desk level with power consumption of only 4 watts per square foot. (Photo right) Ceiling without diffusers. Reflectors act as sound traps to keep sounds from traversing cavity between floor slab and plane of diffusers.

Introduction

When Johann Wolfgang von Goethe, expiring in a perfect torrent of wind produced by the lamenting sighs of many lovely ladies who surrounded the deathbed of the romantic writer, spoke his last earthly words, he said, "More light." Before his much bewailed demise, and while yet able to pursue the same legion of ladies from the rocky headlands of the Baltic to the toe of the Italian boot, he said, "Lamps make oil spots and candles need snuffing; it is only the light of heaven that shines pure and leaves no stain."

The eccentric Samuel Taylor Coleridge, whose literary albatross has hung like the proverbial millstone around the unwilling necks of generations of schoolboys, confided his delight in the heavens to his notebook, saying, "Deep sky is, of all visual impressions, the nearest akin to a feeling."

St. John, Chapter III, Verse 20, of the King James Version, declares flatly that "everyone that doeth evil hateth the light."

Beneath the sky and the light of the heavens rolls the mighty sea of air. A 16th Century physician named Angus Smith sniffed, and said succinctly, "Foul air slayeth like a sword." The thrifty Danes have an expression which rather neatly turns the point on the doctor, "Fresh air keeps the doctor poor."

Since mankind seems destined to earn his bread between walls and under a ceiling, it has become the architect's problem to light the indoor gloom and make the foul air fair. The architect has also had to contend with the tides of the everchanging requirements in the subdivision of building space.

From many desks in a large single room, changes in business procedures and methods of processing business data and other documents may necessitate, occasionally, a shift to many rooms, each occupied by a single individual. Yet, each individual's office must be supplied with services such as light, heat, air-conditioning, electricity and telephone. Or, a group of small offices might, of necessity, be combined into one large space with a quite different demand for services. This shifting, dividing, coalescing and dividing again, happens all too frequently in a dynamic business which fashions its organization to the changing flow and demands of its business. Making such changes in the ordinary office building inevitably generates chaos, breeds expense and consumes time.

The Union Carbide Corporation and their architects, were determined to avoid, insofar as it was possible, the hectic confusion of demolition and construction which follows changes in space requirements. At the same time, UCC asked their architects—Skidmore, Owings and Merrill—to create an attractive work environment which would help produce efficiency and personnel contentment.

Architectural design

Designing the Union Carbide Corporation's new headquarters building on Park Avenue gave the architects a chance to develop a unique solution to the light-air-flexibility problem of large commercial buildings. The solution is an assembly of components and elements called, "the ceiling system." The new building's ceiling system is not the conventional luminous ceiling in which lamps are installed in a cavity above a transparent medium, but is, rather, a continuous plane of contiguous fixtures. These fixtures are independently hung and are framed in place by a grid of cold-roll-formed stainless steel runners. The runners are in two sizes. The major, or "A" runner, was ingeniously formed into a cavity shape which functions as a distributor of conditioned air.

The ceiling, which to the eye is a simple, glareless plane of light, polygamously marries a group of functions to aesthetic appeal.

The functions performed by the ceiling are five:

The first, obviously, is to provide a top finish to the room. To the eye uplifted from the tasks of the day, the tangled mass of service paraphernalia which is hung from the slab above would present a dizzying distraction. The ceiling thus interpolates a soothing, simple pattern which concerns the complexity above.

The second is to provide a source of light. A smooth, almost unbroken indoor "heaven" diffusing a bright but glareless glow over the desks and work tables below.

The third is to disperse fresh, scrubbed, dustless, sootless, warmed or cooled air to the area and to provide an exit for stale, smoky, used air from the area.

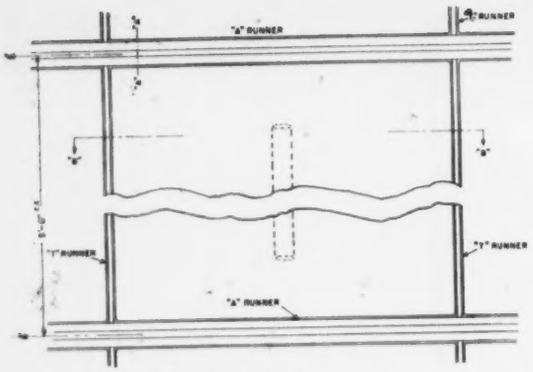
The fourth is to provide a top anchor for the specially designed partitions used to define and subdivide areas throughout the building, in accordance with the needs and functions of the occupants.

The fifth is to block sound from traveling through the ceiling cavity.

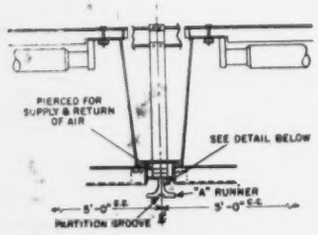
But the ceiling system is not merely functional. It also contributes to the aesthetic unity of the building and avoids the blatant discord of uncongenial materials and multifarious design within and without. The building itself is bold and simple in design, the exterior materials—glass and stainless steel—are the best that can be drawn from modern metallurgy and chemistry. Thus it was imperative that the ceiling system harmonize with this concept and draw from the same scientific resources. Both the interior and the exterior had to reflect the will of the corporation itself to weather the abrasions of time untarnished and undiminished. The choice of materials for the ceiling system—stainless steel and plastic—reflect these prerequisites.

The ceiling system makes another contribution to both function and aesthetics. The ceilings are cheerful, luminous sheets which seem to fit themselves above their measured height and psychologically

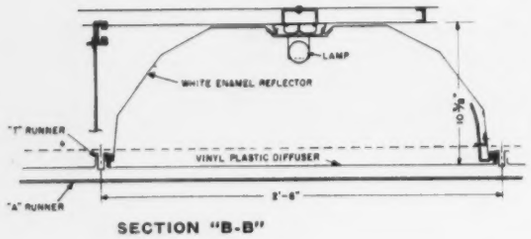
(Continued on page 16)



REFLECTED PLAN



SECTION "A-A"



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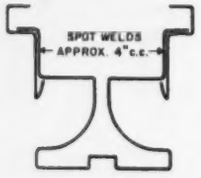
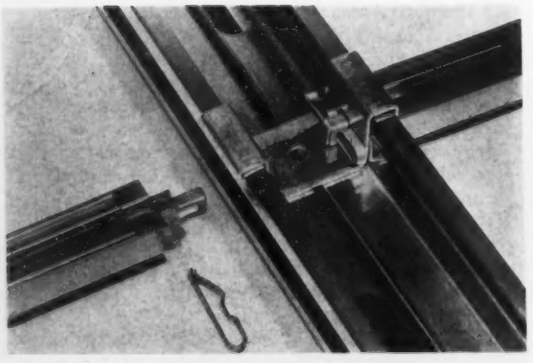


END VIEW OF "A" RUNNER



Exploded view of assembly system for stainless steel ceiling grid. Major or "A" runner receives "T" runner at 2'-6" intervals. Concealed spring steel clips provide connection. Building will utilize 500,000 linear feet of ceiling runner.

UCC'S CEILINGS SYSTEM

(Continued from page 15)

contribute to the elevation of spirits and the infusion of energy.

The efficient organization of the components of the ceiling system begins with the dimensions. The individual fixtures of the ceiling system are 2'-6" wide by 5' long. Thus they readily fit into the predetermined module which was set at 2'-6" by 5' for maximum flexibility.

A preformed tongue on the top of the partition panel fits neatly and tightly into a groove on the underside of the main ceiling runner. A simple adaptor creates a similar tight, rigid joint between the top of the partition panel and the secondary "T" ceiling runners.

A dual system of ducts and connecting boots to serve each 2'-6" by 5' module is fastened to the main ceiling runners, which are slotted and contoured to distribute the conditioned air and exhaust the used air. This system operates to within 15' of the perimeter of the building where a perimeter system takes over.

The upshot of this careful planning is great freedom for office rearrangements. Both the demolition and the reconstruction is clean and dry and does not require modification of the ceiling services. Corridors, for instance, may be created ranging in width from 2'-6" through 5', 7'-6", 10' and on up to any width based on a multiple of 2'-6" depending upon the orientation of the modules. The only limitation on the size of an office is that it must be at least 10' in one of its dimensions. All necessary partition dismantling and erection can be done literally, overnight.

After enclosure, the newly created space will have a ceiling light source which is precisely the same per square foot as an unenclosed space; it will have a perfectly adapted supply of conditioned air and a balanced system for exhausting the used air. The space will be insulated from outside sounds drifting in over the top of the partition and sounds created within the space will not be broadcast outside the space.

Engineering design

The physical and emotional needs of a client are symbolized on paper, sometimes mountains of paper, by the architect, but between the paper and the finished structure stands a team of expert assistants and consultants who lend their specialized knowledge to the architect in creating the physical form of the building and its components.

The Union Carbide Building contains over 800,000 sq. ft. of this ceiling system. Every 12.5 sq. ft. had to be filled with a light fixture, and that fixture had to be fixed in proper place by the ceiling runner grid.

The grid design takes advantage of the inherent qualities of stainless steel. The material selected, type 430 stainless steel, is stronger than any other material available in sufficient quantity at a reasonable price. Aside from its obviously desirable qualities as a material of enduring beauty and easy maintenance, this material is a superior structural metal capable of handling large loads.

Another advantage of the stainless steel runners is that they will not contribute to distortion of the ceiling fixtures. Although the runners do not support the fixtures, contributing only the framing and definition of space, a runner which expanded or contracted beyond certain limits would warp or twist the fixture. Since stainless steel has a fairly low coefficient of expansion (0.0000058) the runner used in the UCC Building cannot twist the reflectors.

Stainless steel is advantageous in another respect: its susceptibility to precise dimensioning, and precise alignment of the butting end joints between lengths of the runners. This characteristic greatly eases the problem of field assembly and contributes to a neat and workmanlike finish.

And finally, the cold rolling process work-hardens the metal so that it can better resist the nicks and scratches which inevitably occur during maintenance operations such as changing lamps and cleaning.

The "A" runner was cold roll formed from 0.022 in. gage strips of type 430 stainless steel, the "T" runner from 0.032 in. gage stainless. The forming was done on a Yoder mill at 28 ft./min. for the "A" runner and 35 ft./min. for the "T" runner, while holding to a tolerance of 0.01 in.

The "A" runner consists of three members which are joined into one by machine welding.

During fabrication, slots 5⅝" long by ⅝" wide were spaced at 10' intervals along one side of the runner for supply and return of the conditioned air. A carefully contoured lip was formed on the slot during the fabrication process with a miniature aerodynamic section which "throws" the conditioned air in the proper pattern of air distribution.

The ceiling grid is easily assembled by means of concealed spring steel clips which bind the minor runners to the major runners at 2'-6" intervals. About 500,000 linear feet of ceiling runner will be assembled for the building's ceiling system.

The ceiling system is designed to evenly distribute conditioned air to maintain 76°F. and 50 per cent relative humidity in summer and 72°F. and comfortable humidity levels in winter. The system will maintain these temperature levels within 2 degrees variation and the humidity levels within 5 per cent variation.

Lighting design

Once the solution to the framing and air distribution problem was in hand, the lighting engineers could design the actual fixture.

The criteria for a well-lighted room for office work was defined for the Union Carbide Building. At desk level, an even illumination with a minimum of 50 footcandles was considered desirable. Moreover, this level of illumination had to be maintained in spite of dust and deterioration of lamps due to decline of lamp efficiency.

The design settled on a rapid start 40 watt fluorescent tube in each 2'-6" by 5' fixture. This is only 4 watts per square foot—one-third less than the 6 watts per square foot previously thought necessary to produce this level of illumination. To achieve an even distribution of light across the inner face of the diffuser, careful angles were built into the reflector. Precise determination of these angles was necessary to ensure that the reflected light augmented the light at the outer edges of the diffuser, which are farthest from the one-lamp light source.

Plastic diffusers

When the light of the lamps reaches the diffuser it must pass through a complex chemical formulation which has been subjected to precise processing and fabrication.

The ceiling system in the new Union Carbide Building uses modern light diffusion shields formed from UCC's rigid vinyl sheet. These materials are basically vinyl chloride-acetate copolymer resin formulations which have been calendered into sheeting at high temperatures. When placed beneath a lighting source, this sheeting permits light to pass

through, and assists in diffusing it evenly over the entire surface of the sheet. Glare is thus greatly reduced, the light source is more efficiently utilized, and shadowless light transmission results.

The vinyl luminous panels used in the ceiling fixture are 29½" by 58" and were especially vacuum-formed. Prior to the vacuum-forming step, the sheets were laminated together from three individual sheets. The lamination consists of two layers of 0.015 in. rigid vinyl sheet plus a layer of 0.001 in. cast vinyl film on the inside, facing the light source. The cast film layer is a smooth surface from which dust may be easily wiped off. Also it absorbs ultra violet light from the source; this light would be harmful to the rigid sheet layers below.

Using rigid vinyl sheet as the diffusing material meant a number of advantages to the manufacturer, the contractor, and to the user, Union Carbide Corporation.

1. The sheeting can be easily formed into panels of various shapes and designs.
2. The material does not support combustion—thus no increase in fire insurance rates occurs because of its use.
3. The panels are durable. They resist the aging effects of ultra violet light, changes in ambient temperature and humidity, and should have a long service life.
4. Maintenance and cleaning are easy, and can be done by building maintenance crews. Light in weight, the sheets can be readily removed and wiped or rinsed in detergent with no harmful effect.
5. The rigid vinyl sheet is the lowest-cost material available for luminous ceiling use.

The diffusers are provided with an aluminum frame and a polyurethane gasket seals the joint between the diffuser and the reflector. This gasket acts in a triple capacity: as a dust seal; a bar to sound transmission; and a seal against the leakage of light.

Maintenance

The architect proposes, the owner accepts, the contractor builds and soon the bright new structure is occupied.

But this is hardly the end of the story: "time's corrosive dew-drop eats," and the managers of the building must marshal forces and do battle with the devourer.

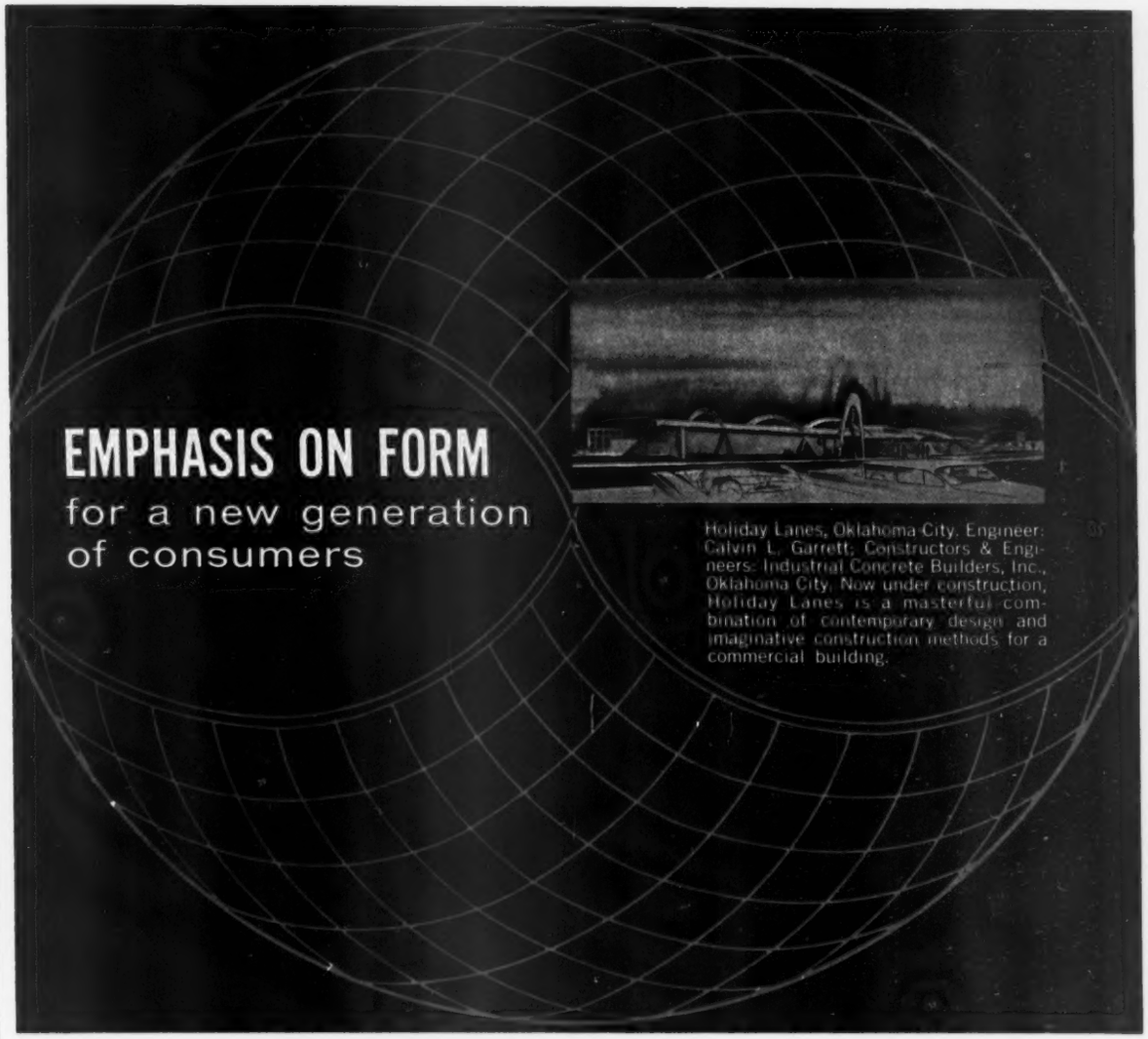
To avoid many of the scars of maintenance, the designers and builders of the ceiling system prepared it for easy access and replacement of the parts which are most vulnerable to wear and easy access to parts which must undergo periodic cleaning.

The diffuser, for instance, is attached to the reflector by four concealed hinges. These hinges are so designed that the maintenance man can open the diffuser (for changes of lamps and for cleaning) from either side in a simple two-step operation.

Although the reflector has built-in dust seals and preventives, should it need cleaning, repainting or changing for any reason, it too is held in place by an easily accessible pair of wing nuts for easy release.

The reflectors itself need not be removed in order to change lamp ballasts. Removing the lamp tubes and loosening two wing nuts exposes the ballasts for changing.

Maintaining the ceiling runners will cause very little worry to the most meticulous housekeeper. The stainless metal is permanently bright and tarnish resistant, needing only an occasional swipe with a cloth to keep it as new looking as the day of its installation.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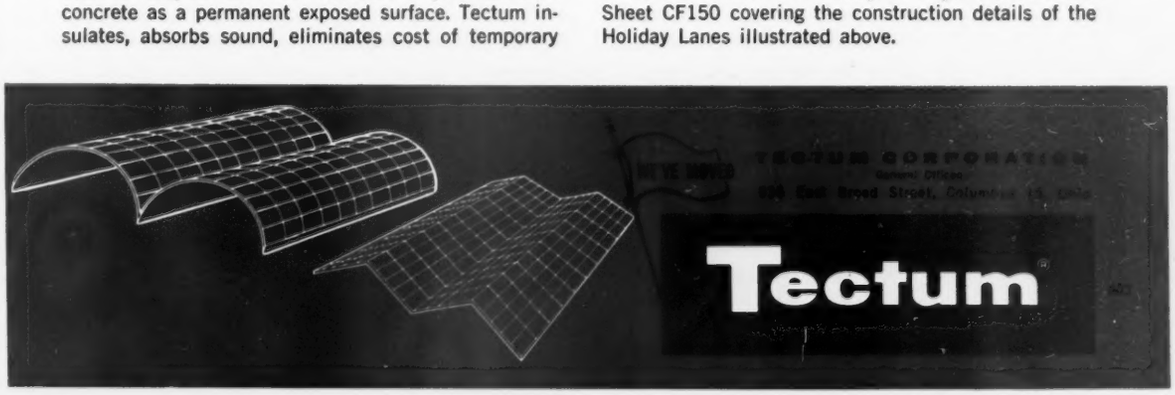

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Trends in Electric Light Source Development & Utilization

by Henry L. Logan*

The new I.E.S. recommended lighting levels, while ahead of general practice, are only level with, and in some cases behind, current advanced practice. As today's advanced practice is the current practice of tomorrow, I expect the new lighting levels to come into general use in due time.

I think the reason is that the fundamental thing both Blackwell's and Weston's work illustrates is that if you want to see as well as you can, you need daylight levels.

For example, you can read a text having a two minute of arc stroke, black on white background, accurately at 90 per cent of the maximum rate with nine footcandles; at 95 per cent of the maximum possible rate with 22 footcandles; at 98 per cent of the maximum possible rate with 60 footcandles; but the maximum rate requires 600 footcandles. That is, if you want that degree of certainty which is optimum, you need a lighting level in the daylight range.

While people do not consciously know this, their bodies do. Their bodies respond so favorably as lighting levels go up, and people feel such refreshing certitude in their perceptions, orientation and actions as lighting levels go up, that they will continue to adopt higher levels as fast as they can afford to: up to the point that they can afford to introduce levels indoors characteristic of the daylight range, outdoors.

This is supported by the universal experience of the lighting industry, here and abroad. The desirability of this is also supported by scientific evidence.

The rate of traffic fatalities drops continuously from a maximum under blackout conditions until it stabilizes at around 1,000 footlamberts, or 3,500 footcandles. In other words, people do not have the speed of detection of visual cues, nor the smooth accurate, optimum integrated responses needed to operate with maximum safety while moving, until a level of about 3,500 footcandles is reached.

This is because the only purpose of light and sight is to get information of the external world. The greater the wealth of information the more secure are you in that particular environment. Unlike the various aspects of conscious seeing, which can be measured apart from each other, such as your ability to see detail, to see contrasts, and your speed of detection, all of which show diminishing returns at low lighting levels, the rate at which visual information becomes available increases rapidly with rising lighting levels.

Change in visual cue population

Change in visual cue population as lighting levels rise occurs because the small changes in minimum visual angle that can be seen, and the small changes in brightness difference that can be perceived as lighting levels rise make possible an enormous increase in the combinations of these small differences that can occur. In fact, the increase in visual cues is exponential. That is, there are constantly increasing returns as lighting levels rise, and the rate of increasing return accelerates as the level gets higher, for all levels shown on the curve.

So it is inevitable for artificial lighting levels to rise as fast as our economy can absorb the rise. It is not higher lighting levels that are in question, but rather how fast can we afford to apply them?

Actually, as I said in the beginning, these higher levels are already here, and have been for some time: not generally, but scattered instances gradually growing in number.

They are not precedent-breaking, except for level. Most of them have been done with current equipment and methods, and it is my judgment that most, if not all, of the new levels can be so secured. A wide-spread application of higher lighting levels will undoubtedly be accompanied by changes in light sources, lighting equipment and application methods; but nothing necessarily revolutionary. There will be a tendency to wider use of the more highly loaded lamps—the *Power Groove*, the very high output, and the high output types; and color corrected mercury. There will also be a tendency to higher line voltages; and to the use of high frequency systems, and any other developments that will permit the use of less copper and more efficient power applications.

Highly loaded fluorescents

The advantage of the more highly loaded fluorescent lamps, and of the color-corrected mercury lamps, is that they pack more wattage and lumens than the standard fluorescent lamps. All things being equal that means less wiring and equipment for high level lighting, and so less costs: but there are sometimes difficulties in turning the inherent advantages, particularly of highly loaded fluorescent lamps, into cost savings. For the efficiency of these latter lamps to be realized they must, at present, be operated within a narrow temperature range. In some applications this means forced ventilation or mechanical refrigeration, which may wipe out cost savings in lighting power, wiring and fewer units. Installed in low ceilings to produce high levels their infra-red radiation may be unpleasant at forehead height. That is, an installation in an 8'-6" high ceiling could be intolerable, when the same installation in a gymnasium, factory or bank, at 25' would be quite satisfactory.

This infra-red radiation is not a new factor. We have been up against it with high level incandescent lighting for a long time. For example, incandescent units that would provide 40 footcandles at working plane, from an 8' ceiling, would also put 233 footcandles, with its accompanying infra-red radiation, on the head of a person 6' tall; and he would feel it rather strongly. It appears from the literature that 125 footcandles of incandescent lighting, and 600 footcandles from fluorescent at forehead height, are about the limit before corrective measures have to be taken on this account.

Corrective measures

One corrective measure has already appeared, for incandescent lighting, here and there—the application of infra-red radiation interceptors, in the form of hear-absorbing glasses and lenses. This is not needed with fluorescent lighting because most of the new recommended levels are still below the critical level at which infra-red radiation becomes unpleasant with fluorescent lamps—except at very low mounting heights.

Another possible solution, applicable particularly to some industrial interiors, would be to speed up rates of air movement. As 900 footcandles of sunlight will produce as much infra-red heating effect as 125 footcandles of incandescent light, and 600 footcandles of fluorescent; and sunlight levels of over 7,000 are common in summer, with infra-red effect equal to about 1,400 footcandles of incandescent, it is obvious that man can be happy and comfortable with illumination levels above 125 for incandescent and 600 for fluorescent, but as in the case of sunlight he will feel perceptible warmth and would require either air movement rates approaching comfortable outdoor rates, or an equivalent drop in ambient temperature. In offices, more rapid air movement may not be feasible because of the blowing around of papers, so the alternative would be a drop in ambient temperature.

HVAC practice

Higher lighting levels will affect both air-conditioning and heating practice. I would just like to point out here that all the wattage consumed by lighting units ends up as usable BTU's of heat input, and will be taken into account in building design as lighting levels rise. A 125 footcandle incandescent job, or a 600 footcandle fluorescent job is practically a complete heating system. Methods will be developed to save on central heating jobs where climate permits, by using the heat by-product from good lighting jobs. This will help to make lighting levels cost less: and perhaps less than the lower levels of today where the heat by-product is not enough to permit economies in building design and separate heating expense.

Lamp trend designs

Returning to the effect of high lighting levels on lamp trend designs, as levels of 500 footcandles can be secured with 40 watt rapid start, standard lamps, mounted 4" on center, in rooms with 10' ceilings, in cooperation with proper lighting equipment; and without direct, or significant reflected glare, we already have what we need to get for more than the new recommended levels in commercial and institutional applications. There is a constant effort going on to improve the efficiencies of these lamps, and theoretically only half the lamps would be needed if they were operated at 1,500 milliamps instead of 425, but the difficulty is that heavier ballasts are required now, and at present the temperature of such ballasts when used in enclosed and recessed units far exceeds the maximum allowable. Commercial louvered, enclosed and recessed units will require considerable re-design before they can safely meet the temperature requirements, when used with these lamps.

Another possibility for improving the output of fluorescent lamps, and thus requiring less of them to be used lies in high frequency operation. There have been some pilot installations, some of which have been less than satisfactory. Pioneering efforts often are; but with the advent of transistorized high frequency converters most of the difficulties will be overcome, and the mating of light sources with high luminous efficiency with high frequency opera-

(Continued on page 21)

* *A registered professional engineer, Mr. Logan is distinguished by service as a Fellow of both the AIEE and the IES; member of the National Board of the AIEE; U.S. Delegate to the International Congress on Illumination in Zurich in 1955 and will be a delegate to the Brussels Conference this year. Mr. Logan is Vice-President in Charge of Research of the Holophane Company, Inc., New York City.*

Circle 111 for further information about ANACONDA →

DESIGNS OF DISTINCTION IN BRONZE

Architects and building owners agree that the copper alloys provide the much desired change in architectural metals. Here are two more distinguished examples showing the broad variety in texture, form, and warm, rich color available to translate architectural concepts into reality. Modern design, as shown here, does not require special production of intricate shapes. Instead, economical use is made of standard bars, channels, angles and formed sheet metal.

For more outstanding examples and fabricators' detail drawings, write for "Architectural Metals by Anaconda." This 64-page book is the first comprehensive publication on the architectural uses of copper and copper alloys. It gives practical and detailed information on the available metals, their compositions, colors, forms, physical properties, finishes, maintenance and suggested specifications. For your complimentary copy write: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass, Ltd., New Toronto, Ontario.

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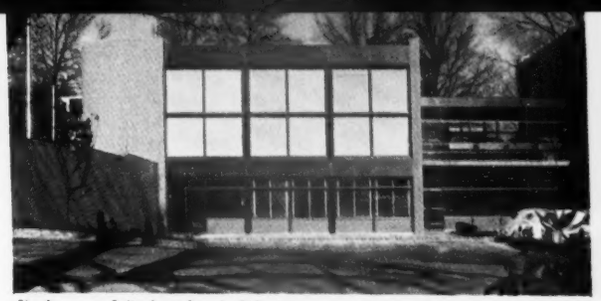
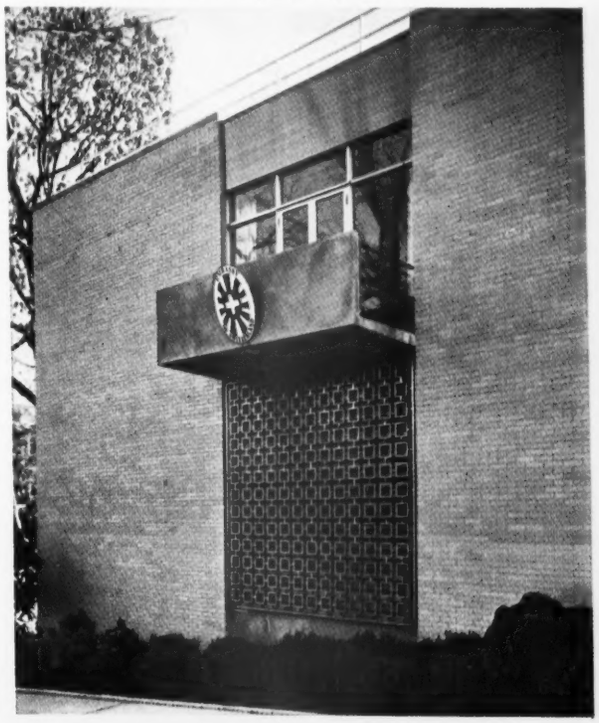
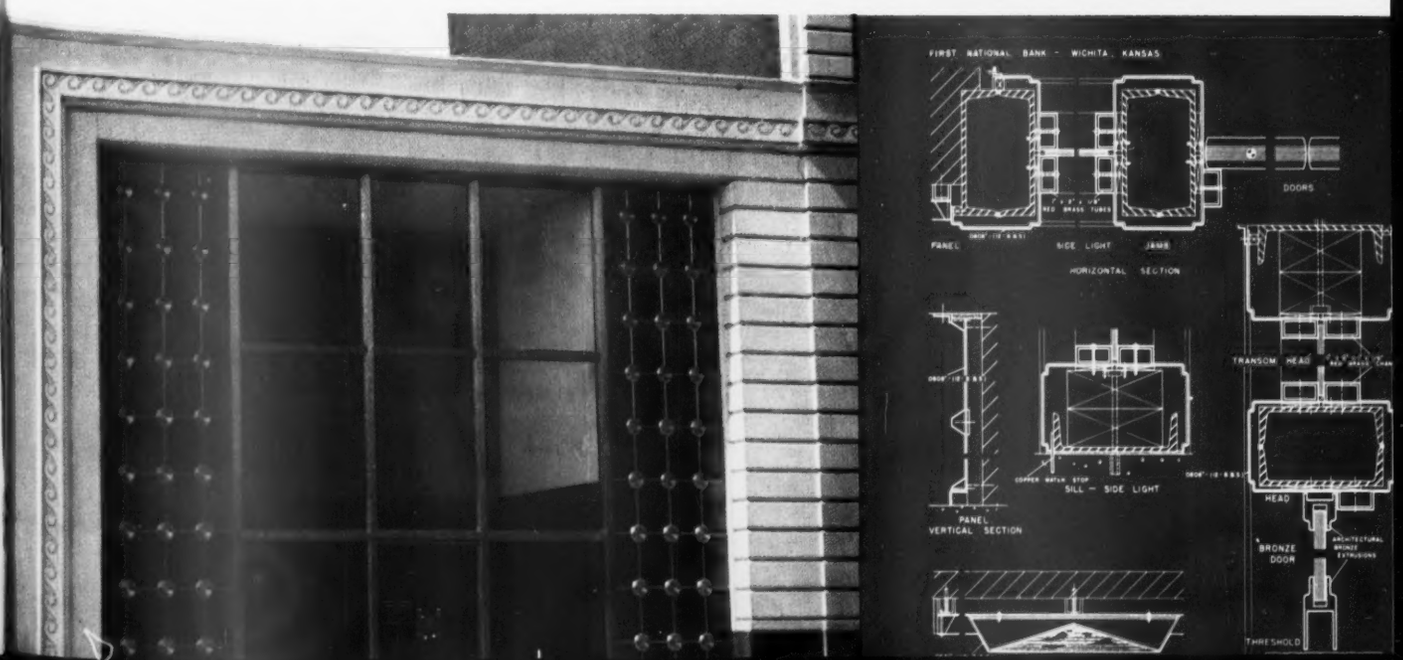


Embassy of Switzerland, Washington, D. C. (above and below). Bronze metals in sheet, rectangular tube, and extrusions were used by the fabricator to execute the architect's designs for spandrels, mullions, fascias, and columns. The grille (below), seemingly of solid bars, is actually fabricated from standard size, rectangular red brass tube. ARCHITECT: William Lescaze, New York. FABRICATOR: A. F. Jorss Iron Works, Arlington, Virginia.



First National Bank, Wichita, Kansas (below). This facade of bronze and glass illustrates the beautiful effect accomplished by applying a statuary finish to some of the bronze work and leaving other components in the natural, bright finish of the metal. The installation consisted largely of sheet metal, flat, spun, or formed with a press brake. Standard sizes of drawn red brass channels and rectangular tubes were used for the stops in the glass area; and extruded shapes for the door rails, panel dividers, and thresholds. ARCHITECT: Forsblom & Parks, Wichita. FABRICATOR: The Alumiline Corporation, Pawtucket, R. I.



RIGHT

FOR YOUR FINEST BUILDINGS

Strikingly different in its clean, functional styling, the superbly engineered new Oasis On-A-Wall Water Cooler adds quality to every modern building.

You add richness to any decor, for the On-A-Wall is the first water cooler to have a cabinet of 20 gauge steel with mar-resistant Vinyl Laminate exterior in Silver Spice color. Its crisp, modern look is enhanced by the recessed anodized aluminum grille with its sleek basketweave pattern.

Practical, too, because it's off the floor... easy to clean around. The Oasis On-A-Wall Water Cooler is mounted flush with the wall to save space and conceal plumbing.

Yet at a touch of the famed Dial-A-Drink bubbler that's built like a fine watch, Oasis engineering goes to work to supply never-failing, refreshing cool water. Oasis engineering has the finest record of trouble-free performance in the industry.

With the highest anti-splash back of any off the floor cooler, the On-A-Wall has a stainless steel top and deep basin with anti-splash ridge. It's easily mounted, and is available with capacities of 7 and 13 GPH.

Write for handsome 4-color Architect Album assembled especially for architects and engineers. It has complete specifications on Oasis—America's finest and most complete line of water coolers. Or look in Sweet's AIA File No. 29-D-42.

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Manufacturers of the most complete line of water coolers. Distributed in Canada by G. H. Wood & Co., Ltd.

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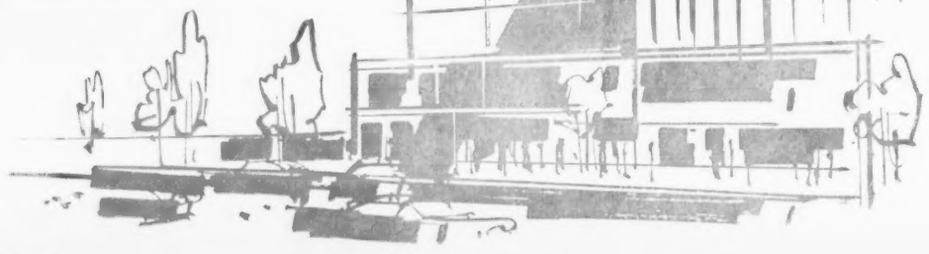


Circle 112 for further information

ELECTRIC LIGHT SOURCE

(Continued from page 18)

tion may become the safe, economical and practical approach to much high level fluorescent lighting.

As to specific lamps, the standard fluorescent lamps with which you are familiar will permit the use of high level lighting, with standard equipment, on or in ceilings up to at least 15 feet in small rooms, and up to 20 feet in large rooms; for industrial, commercial or institutional applications.

The highly loaded lamps, *Power Groove*, *Super Hi Output* and *Very High Output*, find their principal applications at present in medium and high bay industrial locations, and outdoor use, where they can be used in open equipment with good air circulation to keep the lamp and ballast temperatures down; and where the ambient noise is high enough to smother the ballast noise.

The latest addition to this group of lamps, the *Power Groove* with sidewise oriented grooves, illustrates the trend to still larger packages of light with high efficiency; the initial output being 15,000 lumens, with a total wattage of 258 or about 57 lumens per watt.

While higher loaded fluorescent lamps, and high frequency operations, are available as means of getting some of the new lighting levels, they are a supplement to standard sources, rather than a replacement; and bring their own individual problems that will take some time to fully solve.

Mercury lamps, both clear and with various degrees of color correction, are also being used for the production of high lighting levels; and their use is increasing; not only in industry, but in commercial and institutional lighting. They are being increasingly used to light high mounting areas, such as gymnasiums and auditoriums in schools and colleges, various sports arenas, and the ground floors of high ceilinged banks; and this trend will continue with gradual improvement in efficiency and color properties. While the highly loaded fluorescent lamps offer packages as large as 15,000 lumens, the mercury lamps extend this range for a single lamp up to 55,000 lumens; also with the advantage of an economic life of 9,000 hours. These practical advantages of high output with replacement only once every five to nine years will result in a growing use of this type of light source; but again, they are simply additional tools that will supplement, rather than replace present standard lamps.

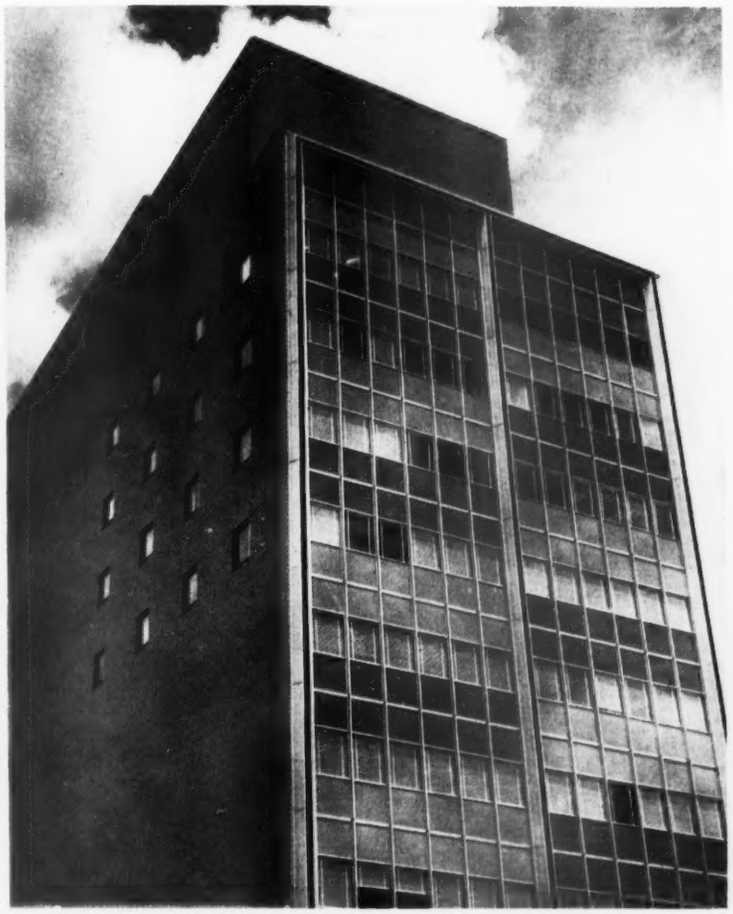
Vertical filament use

Finally, the trend in incandescent lamps is the increasing use of the vertical filament to permit smaller lamps to be used with outputs equal to the larger lamps of the past, which has space saving advantages, and will improve the possibilities of building up high levels locally on work-points, particularly in industry and stores. Their use poses no particular problem and simply represents a practice that has been with us from the beginning, but which has been more popular at some periods than others.

With respect to equipment we can look for a split trend in industrial applications: one, to open, naturally ventilated fixtures using the higher-loaded fluorescent lamps: particularly for high bays; plus the development of closed units that can safely meet the temperature requirements. At least one such unit has been developed containing its own motor and fan, with automatic thermostatic control to keep the interior of the unit and ballast at safe operating temperature.

NEWS from Dow Corning

Brick Finds A "Protector"



New Factory-Applied Treatment Keeps Brick Clean and Attractive

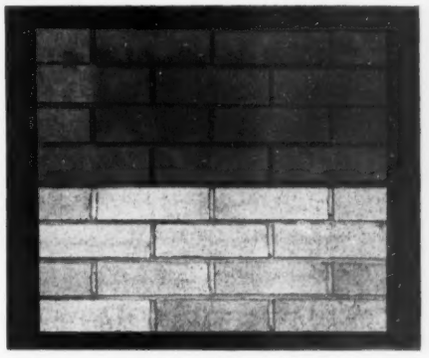
For centuries, brick has been one of the architect's best friends. But sometimes even this versatile material has a few faults, such as efflorescence and dirt pick-up, especially in the more decorative shades.

Now, chemistry has found a way to minimize brick staining and discoloration. It's Silaneal® . . . a treatment applied to brick *at the factory*. Already evaluated in tests prescribed by Structural Clay Products Research Foundation and thoroughly field-proven in numerous buildings, Silaneal preserves the beauty of even the most delicate hues of brick. And, as if this weren't enough, Silaneal also makes brick easier for the mason to lay up.

Silaneal makes brick water-repellent, so surface dirt is washed off by rain rather than being absorbed into the brick. Silaneal also prevents water from leaching salts from brick or back-up materials and then depositing them on the surface . . . the cause of efflorescence. Thus, brick protected with Silaneal stay clean during storage and after installation. Their beauty is preserved.

Silaneal has the further effect of making brick easier to lay up. Reason: It gives brick what is known as a "controlled suction rate". Generally speaking, the lighter shades of brick have high initial absorption . . . they tend to suck the water from mortar very rapidly. This results in a poor mortar joint because there is insufficient water retained in the mortar to give proper hydration. Because Silaneal gives the brick a controlled suction rate, mortar stays workable longer . . . brick needs no soaking. Other benefits: More mortar can be spread at a time, and more courses laid before the joints are struck. Total benefits: protected beauty, easier construction, happier clients.

In the large picture you see one of many constructions using the new "beauty protected by Silaneal" brick. In this case the treated brick were supplied by Reliance



Clay Products. Architect: Wyatt C. Hedrick, A.I.A. Pictured above is a test wall in which all bricks are identical except that the bottom four rows were treated with Silaneal, whereas the top four rows were untreated. Note heavy discoloration of untreated brick after six months' exposure in northern climate. Bottom bricks are still like new.

SILANEAL®
keeps brick clean

For more information and names of manufacturers supplying brick treated with Silaneal, write Dept. 0706.

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THE NEW QUANTITATIVE METHOD FOR ESTABLISHING ILLUMINATION LEVELS FOR VARIOUS VISUAL TASKS

by Dr. H. Richard Blackwell

Dr. H. Richard Blackwell, Director of the Institute for Research in Vision at Ohio State University, is also a professor of physiological optics and research professor of ophthalmology. Prior to his present affiliation, he was associate professor and director of the Vision Research Laboratories, University of Michigan. In addition, he has a wide background in vision research including positions with the Armed-Forces-National Research Council Vision Committee, the Polaroid Corp., and the Tiffany Foundation. He received his B.S. degree at Haverford College, M.S. at Brown University, and his Ph.D. at the University of Michigan. Dr. Blackwell is still a member of AF-NRC Committee on Vision, and is Secretary to the Working Committee on Visual Performance of the International Commission on Illumination.

Introduction

During the years from 1950 through 1958, my associates and I at the Vision Research Laboratories of the University of Michigan conducted a comprehensive research program in order to develop a new quantitative method for establishing the footcandle levels required for adequate performance of various visual tasks. Performance adequacy was measured by the accuracy of performance and by the rate at which items of visual information can be obtained from the visual environment. It is important that illumination levels are used which provide adequate performance of various visual tasks, since there is every reason to believe that levels of illumination which provide adequate performance will also provide optimum conditions for the learning of visual skills, and for visual comfort.

The research program included an analysis of visual performance in terms of the process of the visual assimilation of information from the environment. On the basis of this analysis, extensive laboratory studies were made of the accuracy and rate of visual information assimilation for standard luminous disc targets. Then, studies were made of "field factors" to be used in interpreting the conditions under which visual tasks are performed in the field, in terms of the laboratory data previously obtained. A Visual Task Evaluator was then developed, to be used in interpreting various visual tasks in terms of the standard luminous disc targets previously studied extensively. Finally, 56 practical tasks selected by various technical committees of the Illuminating Engineering Society were evaluated with this method, and illumination levels were established, providing an adequate level of visual performance for each task. In the following sections of this report, the various phases of this research program will be reported briefly to provide the basis for an understanding of the illumination level established for each task.

Visual information assimilation

The visual system is primarily an information-assimilation system and visual performance refers, therefore, to the rate at which information is correctly assimilated. It is well known that the level of illumination of a visual task influences the capacity of the visual system to assimilate information, as do characteristics of the task such as the size and contrast of the "critical detail." In order to develop a general method for specifying the quantity of interior illumination required for various visual tasks, we require first an index of the capacity of the visual system to assimilate information.

Selection of an index of visual capacity is complicated by the fact that the visual system is not a passive information assimilator, but normally follows a complex adjustment procedure designed to facilitate the extraction of information from the environment. The eyes normally fixate one point in the visual environment, then the two eyes change accommodation and vergence so that the clear images are produced in each eye and binocular fusion occurs for the two eyes. During the fixational pause, information is assimilated from various parts of the environment, in a receptive field centered around the point of fixation. This information directs the eyes to a new position in space, with appropriate signals being sent to the oculomotor adjustment mechanisms to insure appropriate accommodation and vergence changes. Records of eye movements during the self-pacing information assimilation involved in reading continuous text, for example, reveal that the eyes exhibit repeated glances at some points in space and virtual skips over other points, indicating the complex inferential and associative aspects of this activity. There is no simple manner in which to specify the amount of information assimilated under these circumstances, and we must look elsewhere for development of a measure of visual capacity to assimilate information.

The problem of specifiying visual capacity becomes manageable if we restrict ourselves to the information which can be assimilated within a fixational pause, normally lasting about 0.2 seconds. It is possible to prevent the eyes from their normal self-pacing activity by presenting information only to observers whose eyes are stabilized in advance of presentation of the information to be assimilated. Visual material may be selected for which the informational content is specifiable. Then, the rate at which information can be assimilated may be inferred from the presentation of controlled amounts of information for controlled durations.

Systematic studies have been made of the capacity of the visual system to assimilate information at different levels of luminance, and for tasks varying with respect to both size and contrast. The standard task has been detection of the presence of a luminous disc presented on a background field of otherwise uniform luminance. Since the observers are required to detect merely the presence or absence of the disc, the task may be considered to have an informational content of one item. When the disc is presented for a full second, the corresponding visual capacity is one assimilation per second (APS). When the disc is presented for 1/30 second, for example, the corresponding visual capacity is 30 APS. A visual capacity in excess of 5 APS presumably means that more than one informational item can be assimilated in a fixational pause. A visual capacity of less than 5 APS presumably means that more than one fixational pause is required for assimilation of the informational item.

Recent experiments[1] have shown that the visual system can indeed assimilate at least two items of information from a single point in the visual environment within a fixational pause. Other experiments[2] have shown that the visual system can assimilate 8 to 12 items from different points in the visual environment within a fixational pause. These, and other experiments suggest that the visual system provides time-space scanning of the visual environment. The "scanner" interrogates various adjacent points in space across time, repeating this process at least twice within a fixational pause. This time-space scanning is probably responsible for the enormous information-assimilation capacity of the visual system even when the eyes are not permitted to move appreciably. It is difficult to set an upper limit on the informational-assimilation capacity of the system, but it would appear to be at least 30 APS.

Experiments[1] have also shown that when the information available to the visual system is reduced below one item per fixational pause, the system acts as though it repeatedly fixated the same item, improving its informational capacity by a probability-summation mechanism which treats each fixational pause as an independent statistical event. Under these circumstances, the capacity of the system may be said to be information limited.

There are visual tasks in which a motor response represents a sequential component which may limit the rate of visual assimilation. Such a limitation is apparently present, for example, in the task Weston[3] used in his performance studies. Response limitation does not appear to be present in the self-pacing assim-

ilatory activity involved in reading continuous text.

Consideration was given to selection of a suitable level of visual capacity to provide by recommended levels of illumination. A 5 APS level represents the minimum level of visual capacity it would be reasonable to provide the visual system, since this level permits scarcely more than one item of visual information to be assimilated per fixational pause. This level was selected for use in the illumination specification system, until more information can be collected regarding the assimilation of multiple items of information in each fixational pause.

Performance data on luminous disc targets

Performance data on luminous disc targets has been collected intermittently since 1950. The bulk of this data was reported in 1952.[4] Additional studies have been made recently to confirm the nature of the data in the luminance range of greatest interest in connection with the specification of illumination levels. The new data, and the method used to combine it with the older data, is reported elsewhere in detail,[5] as are the methods used to obtain the best-fitting smooth curves through all the data.

The data consists of curves, in which are plotted values of the contrast of the luminous disc for 50 per cent detection accuracy, for various values of the luminance of the background. Data is presented for discs of five sizes. Such sets of data are available for various levels of visual capacity from the one to the 30 APS level. In accordance with an earlier paper,[6] target contrast is defined as follows:

$$C = \frac{B_T - B}{B}$$

where B_T = luminance of the disc; and B = luminance of the background. For luminous discs brighter than their background, contrast varies between zero and infinity.

Complete accuracy curves are available, so that data may be readily obtained from any accuracy level of interest. For the purposes of an illumination specification system, it was decided that an accuracy level of 99 per cent would be suitable.

Field factors

It is certainly not appropriate for performance data obtained under the exceptionally favorable conditions of the laboratory experiments reported above to be used directly as the basis for an illumination specification system. The observers were given exceptionally complete information concerning the size and shape of the target, and its time and place of occurrence. Because they were allowed more than adequate time for aligning their eyes with the location in which the target was to appear, and for adjusting ocular accommodation and convergence, the observers did not require a receptive field of any appreciable size. That is, the target had only to be visible precisely on the fixational center; it was not necessary for it to be visible over any appreciable area around the fixational center. Of course in normal self-pacing ocular information assimilation, there must be an appreciable receptive field over which visual tasks will be visible in order to provide sensory guidance to the oculomotor adjustment mechanisms. Furthermore, the observers utilized the forced-choice psychophysical method[7] which results in exceptionally fine visual performance. For these reasons, it was decided that "field factors" should be determined to take approximate account of these various differences between laboratory observing and what might be called common sense seeing.

Two approaches have been used in establishing field factors. A series of experiments have been performed in which the effects of the various differences between the laboratory and everyday use of the eyes were investigated one by one. In addition, a Field Task Simulator has been constructed and one value of the field factor has been determined, representing the combined effects of all the differences.

The first of the analytical experiments was concerned with the difference in the criterion used by the laboratory observers performing with the forced-choice method, and the criterion implied by common sense seeing. A total of 74 observers were employed in a series of experiments, in which the average difference in the threshold criterion between the naive observer and the trained laboratory observer was determined. The difference in criterion could be compensated by multiplying the threshold contrast obtained by laboratory observers by a factor of 2.50.

The effect of needing a receptive field over which the task can be visible so as to provide sensory guidance to the oculomotor adjustment functions was evaluated by measuring the threshold contrast for a small disc target at various locations with respect to the fixational center. It is possible to determine from this data values of a multiplicative factor representing the increase in the threshold contrast required to extend the receptive field to any desired distance from the fixational center. Sample contrast factors are presented in Table I.

Radius of receptive field (degrees)	Multiplying factor
1	1.66
1.5	2.57
2	4.00
3	7.41
4	11.0

Table I. Contrast factors for enlargement of the receptive field.

It would seem reasonable to suppose that the receptive field should be enlarged to a 2 degree radius in all directions from the fixational center. This enlargement would require a contrast multiplier of 4.00.

In the performance of most actual tasks, knowledge concerning the precise time and place of occurrence of task detail is lacking. A series of experiments were conducted to assess the increase in the contrast of circular disc targets needed to compensate for these differences between laboratory observing and seeing under actual field conditions. It was found that eliminating the observer's knowledge of the precise moment when the target would appear increased the threshold contrast by 1.40. Reducing the observer's knowledge as to the precise location to be occupied by the target, by using two possible locations in the visual field, increased the threshold contrast by 1.31. The reduced frequency of tasks which often accompany lack of knowledge concerning the time or place of occurrence of the task increased the threshold contrast by a factor of 1.10. It is not necessarily meaningful to combine the effects of various losses in information concerning the task by multiplying these factors together. Considering the rather primitive state of our knowledge of this problem, it is perhaps most reasonable to use a factor of 1.50 to represent the effect of a moderate loss in information concerning the task, and a factor of 2.00 to represent the effect of a considerable loss in information.

We may combine the factors representing all the differences between the conditions of laboratory observing and those of common sense seeing under actual field conditions. Combining the factors of observer criterion and enlargement of the receptive field, we obtain a factor of 10.0. Allowance for various amounts of information reduction yields factors of 15.0 and 20.0, corresponding respectively to moderate and considerable loss in information concerning the task.

The Field Task Simulator was designed to permit us to evaluate a field factor directly by comparing performance under conditions resembling at least some practical tasks with performance under the usual laboratory conditions. To simplify this comparison, the visual task in the simulator was made basically identical with the task previously studied in the laboratory, being the detection of the presence of a luminous disc on a field of otherwise uniform luminance. In the simulator, the discs were presented in the centers of a few of 50 plaques located around the edge of a 7 foot wooden platform. The platform could be revolved at any desired speed, so that the observers could be forced to scan the moving platform for "imperfect" plaques; that is plaques with small luminous discs in their centers. The observers were able to view six plaques at once; they were required to indicate detection of each imperfect disc by pressing an indicator button located just beside the plaque. This task allowed the observers to scan and respond in an efficient manner so that the task did not seem to be response limited.

Comparisons of data obtained in the simulator with data obtained under the usual laboratory conditions revealed that the contrasts for equal accuracy were between 6.00 and 7.25 times as high in the simulator. It is to be emphasized that trained laboratory observers were used in the simulator, and that the task represented a kind of forced-choice situation. Thus, the field factor derived from the simulator data would have a value of from 15.0 to 18.1. The analytical approach to this problem suggested a field factor from 15.0 to 20.0, which is considered to be quite good agreement between the results of the two approaches. Thus, the study in the Field Task Simulator provides some verification of the reasonableness of the field factors arrived at by analysis. To be conservative, a field factor of 15 was selected for use.

Visual task evaluator

The basic principle in the illumination specification system involves comparing each practical visual task of interest to a standard disc target, and then using our performance data for the disc target of equivalent difficulty to determine the illumination needed to provide selected levels of accuracy and visual capacity for the practical task. The equivalence is established in an optical comparator known as the Visual Task Evaluator (VTE)*. Basically, the practical task of interest is reduced to visibility threshold by a variable contrast wedge** without any appreciable change in adaptational luminance. Then, the initial contrast or size of a standard disc target is varied until this task is at its visibility threshold when its contrast is reduced by the same amount. Initially, VTE measurements were made by varying the size and the contrast of the standard disc separately; it was found by experiment that variation in the initial contrast of the standard disc was the more satisfactory method of the two. Accordingly, all final VTE measurements were made by varying the initial contrast of a standard disc target, arbitrarily selected to subtend 4 minutes of arc. Provision was made in

(Continued on page 24)

**Designed by my associate, Benjamin S. Pritchard.*
***Developed by Prof. D. M. Finch of the University of California at Berkeley.*

BLACKWELL

(Continued from page 23)

the VTE measurements for insuring that the adjustments of the practical and the standard tasks to threshold visibility were made at the same adaptational luminance. The complex assumptions of the VTE measurements are described in detail elsewhere.[5] In brief, the measurements are completely valid only if the threshold performance curves for various practical tasks are parallel on logarithmic scales of task contrast and background luminance to the threshold data for the standard disc targets. Threshold data for tasks very different from disc targets have been found[6] to yield very nearly parallel curves, so that this assumption has at least some supporting evidence.

Measurements with the VTE result in values of the contrast of a 4 minute standard disc target which is equivalent in difficulty to each practical task. These equivalent contrast values may be used to establish illumination levels for the various tasks, on the basis of a performance specification curve derived from the laboratory performance data and the field factors described previously. The performance specification curve was constructed to correspond to the conditions of 99 per cent accuracy, a field factor of 15, and an APS level of 5. This curve represents the relationship between log target contrast and log background luminance. A given value of background luminance corresponds to the value of equivalent contrast assigned to each visual task by the VTE measurement process. Requisite illumination for each task is computed from this luminance, together with the average reflectance of each task.

Evaluation of 56 sample visual tasks

A total of 56 sample visual tasks were submitted by various technical committees of the IES. These tasks were individually evaluated by the VTE procedure, and illumination levels for each non-specular task and luminance levels for each specular task were determined. The values are presented in Table II. This data provided the quantitative basis for the new footcandle recommendations adopted by the IES.

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Table II. Values of illumination or luminance for 99 per cent accuracy

Field factor—15 Visual capacity—5 APS

Task no.	Task description	Log C	R	E(ft-c) for Non-specular tasks	B(ft-L) for Specular tasks
1	Reading while writing: sample of ink-writing, one 6th grade student	.273	.76	1.38	
2	Reading while writing: samples of No. 2 pencil writing, twelve 6th grade students with poorest writing in class of 31	—.167	.76	63.0	
3	Reading: 8-point Bodoni type	.228	.70	1.87	
4	Reading: 6-point textype	.144	.70	2.98	
5	Reading: 8-point textype	.333	.70	1.13	
6	Reading: 10-point textype	.372	.70	0.94	
7	Reading: 12-point textype	.478	.70	0.60	
8	Reading while transcribing: sample of shorthand copy with No. 3 pencil	—.181	.79	76.5	
9	Reading: typed original, good ribbon	.397	.62	0.97	
10	Reading: typed original, extremely poor ribbon	—.338	.62	3140.	
11	Reading. typed carbon, fifth copy	—.194	.53	133.	
12	Reading: dark blue mimeograph stencil, with clear plastic overlay	.498	.11	3.54	
13	Reading: Thermofax copy, poor quality	—.278	.63	589.	
14	Reading: No. 2 pencil on tracing paper over blueprint	.050	.59	6.58	
15	Cutting. white chalk mark on blue serge cloth	.664	.020	10.4	
16	Inspection: dot defects on dark blue cloth	.562	.017	17.8	
17	Inspection: gray line defect on black cloth	.369	.024	27.5	
18	Inspection: darned blemish on gray cloth	—.022	.10	74.1	
19	Inspection: brown stitching on brown silk		.12		
a.	vertical stitching	—.398		>10000.	
b.	horizontal stitching	—.022		61.7	
20	Inspection: gray stitching on gray silk		.076		
a.	vertical stitching	—.268		4160.	
b.	horizontal stitching	—.468		>10000.	
21	Cutting: orange chalk on light brown tweed	—.168	.18	266.	
22	Cutting: white chalk on gray cloth	—.018	.33	21.0	
23	Inspection: light stitching on blue serge cloth		.018		
a.	vertical stitching	.915		5.05	
b.	horizontal stitching	1.191		2.22	
24	Inspection: pattern threads, men's silk and wool suiting	—.021	.22	32.9	
25	Inspection: dark brown raised threads on silk	—.180	.035	1680.	
26	Inspection: blue-gray raised threads on silk	—.283	.046	9650.	
27	Inspection: pattern threads, white handkerchief	—.045	.91	9.86	
28	Inspection: pocket stitching, tan shirt	—.318	.53	1890.	
29	Reading: price tag, pencil	—.236	.63	241.	
30	Reading: price tag, ink	.127	.76	3.10	
31	Inspection: broken white wool thread on spinner bobbin		.66		
a.	30° illumination	.302		1.26	
b.	normal illumination	.042		6.32	
32	Inspection: broken black thread on spinner bobbin, 30° illumination	—.174	.018	2920.	
33	Inspection: broken gray thread on spinner bobbin, 30° illumination	.295	.079	11.8	
34	Inspection: broken white nylon thread on spinner bobbin, 30° illumination	—.279	.78	487.	
35	Inspection: skip defect, viewed from 16 feet	—.080	.19	71.0	
36	Inspection: tight sound edge knot, viewed from 16 feet	.121	.19	12.9	
37	Inspection: bark wave viewed from 16 feet	—.193	.19	381.	
38	Inspection: small decay spot, viewed from 16 feet	—.443	.19	>10000.	
39	Inspection: chip grain, viewed from 16 feet	—.323	.19	6470.	
40	Inspection: small seasoning check, viewed from 30 inches	—.181	.19	317.	
41	Inspection: small skip defect, viewed from 30 inches	—.148	.19	187.	
42	Inspection: chip grain, viewed from 30 inches		.19		
a.	no specular	—.243		1030.	
b.	specular	.114		13.4	
43	Inspection: brown color difference in cloth	—.211	.12	870.	
44	Reading: proofed type	—.442			>3160.
45	Reading: unproofed type	—.283			447.
46	Reading: vernier calipers, non-etched	—.300			631.
47	Reading: new micrometer, etched	—.022			7.41
48	Reading: old micrometer				
a.	specular on numbers	—.233			148.
b.	specular on division	.030			4.62
49	Reading: white line on blueprint, tracing paper overlay	—.558	.59	>5090.	
50	Inspection: brown thread stitching on brown silk tweed	—.593	.12	>10000.	
51	Cutting: white chalk on tan cloth	—.561	.24	>10000.	
52	Inspection: rolled-edge defect on white handkerchief	—.725	.91	>3470.	
53	Inspection: seasoning check, viewed at 16 feet	—.545	.19	>10000.	
54	Inspection: brown stain on gray cloth	—.523	.12	>10000.	
55	Inspection: brown spot on red necktie	—.545	.084	>10000.	
56	Inspection: brown spot on tan necktie	—.694	.18	>10000.	

Niagara Power Project

The $720 million Niagara Power Project is the greatest hydro-electric development ever undertaken in the Western World. It is not surprising, therefore, that the unique engineering problems it presents are being solved with unique techniques—some of which will be briefly reviewed in this article.

The Niagara River drains four of the five Great Lakes, a natural watershed with a surface of 263,440 square miles. It carries off 207,500 cubic feet of water per second, at the annual average flow. Man began to harness this power as long as 200 years ago. As time went on, more and more mill races and turbines were thrust into the cascade to tap the vast supply of energy.

At first there was no coordinated general plan for development of this bounty, as there was no need for one. In terms of the sparse population in upstate New York and Canada 200 years ago and the prodigality of nature, it must have appeared, in those days, that so much wealth—of natural beauty as well as power—could never have been exhausted, nor diminished appreciably, nor sullied by the transitory works of man. It must have seemed like carrying buckets of water from the Atlantic Ocean.

The growth of population and technology has since proven that man can dissipate and recreate great natural resources. He has turned rain forests into desert and deserts into rich farmland, reclaimed swamplands and dredged deep-draft channels to the remote interior. Today he can abuse as well as use the natural resources of power and beauty provided by the mighty cataracts of the Niagara. This posed several problems.

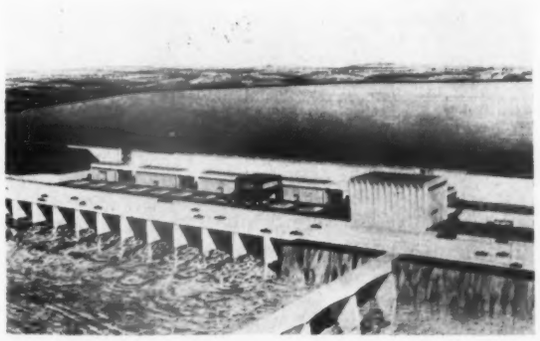
Fortunately, it was realized early that the scenic beauty of the world-famous Niagara Falls must not be sacrificed to power production. In 1906, Congress passed the Burton Act which limited U.S. diversion of the Niagara's water to 15,600 cubic feet per second and in 1910, a U.S.-Canadian treaty set a limit of 56,000 cubic feet per second as the total diversion of both countries.

In 1950, a new treaty approached the problem differently. It decreed that during the tourist season (April 1 to October 31), no less than 100,000 cubic feet per second must be permitted to flow over the falls; at other times, the flow could be reduced to 50,000 cubic feet. It provided further that excess water be divided equally between the two nations.

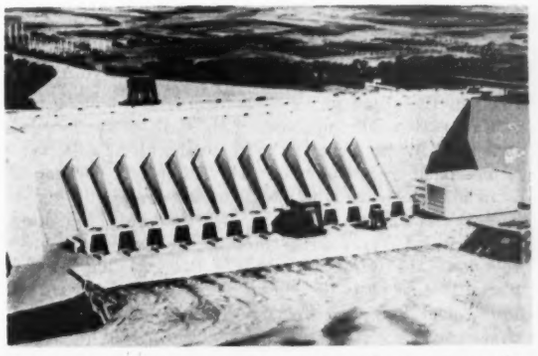
The treaty is currently being implemented on the U.S. side of the border by the $720 million Niagara Power Project. Development is well advanced under the auspices of the Power Authority of the State of New York. The Boston firm of Uhl, Hall & Rich is serving as general engineering consultants for design and construction of the project.

Annual energy output is expected to amount to 13

(Continued on page 26)



Tuscarora pump plant becomes generating plant as water from reservoir is drained back into afterbay, its pumps now functioning as turbines and its motors as generators.



Water will turn turbines in massive Niagara Generating Plant returning the diverted water into the lower Niagara River miles downstream from the point where it was drawn.

NIAGARA POWER PLANT

(Continued from page 25)

billion kilowatt-hours, with maximum installed capacity rated at 2.19 million kilowatts. Initial operation of the generating system is slated for February 10, 1961.

Intake (see map) will be at a point above the Falls where surface of the Niagara River is at a mean elevation of 563 feet above sea level. Mean elevation at the tailrace below the main Niagara Generating Plant is 250 feet, giving an average head of 313 feet net for power purposes. Intake elevation approximates the level of Lake Erie. Tailrace elevation is about level with the surface of Lake Ontario.

The diverted water will be moved underground along a course almost due north across the City of Niagara Falls, next across the town of Niagara, and then well into the town of Lewiston. This stretch of the diversion will be contained in two parallel concrete conduits placed below ground by the cut and cover method.

Water will be taken off the river through two 700 foot long reinforced concrete structures each having 48 slotted apertures, tops of which will range in depth between 13 and 26 feet below the river level at this point. From each of these structures, the water will be moved through a vertical lift gate, 49 feet wide and 68 feet high, then released into one of the concrete conduits.

Two conduits handle 83,000 CFS

Each conduit will be 66 feet high and 46 feet wide and will be capped by a three-hinged arch concrete roof. Thickness of concrete in walls and base will vary generally between 2½ and 3 feet, will be even thicker at the base of the arch. Tops of conduits will be, on the average, 40 feet below ground level, the base being 106 feet below ground level. Slope will be about ¾-inch per 100 feet for most of each run. Each conduit will be 22,000 feet long and the water will lose about 11 feet elevation in this stretch of the diversion.

The two conduits will pass 83,000 cubic feet of water per second. Water will flow through the conduits at a rate of about 11 feet per second.

The method used to pour the vertical walls of the concrete conduits is remarkable. Massive sections of the wall are poured at each stop of a mobile scaffold complete with concrete forms on either side. This rig shuttles back and forth through the open cut depositing whole sections of concrete conduit wall forms ready for the concrete to be poured.

Sealing joints

Joints formed by the wall sections and the concrete base are sealed with sheet lead to insure that they are water-tight. The lead also serves as a lubricant to take up any stress induced by differential movement of the adjacent concrete members.

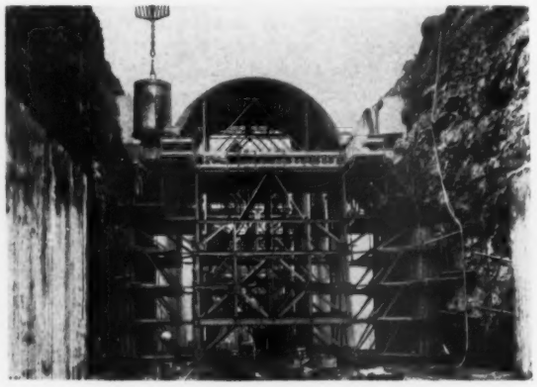
Excavation having been completed, a section is prepared for pouring of the vertical wall as follows:

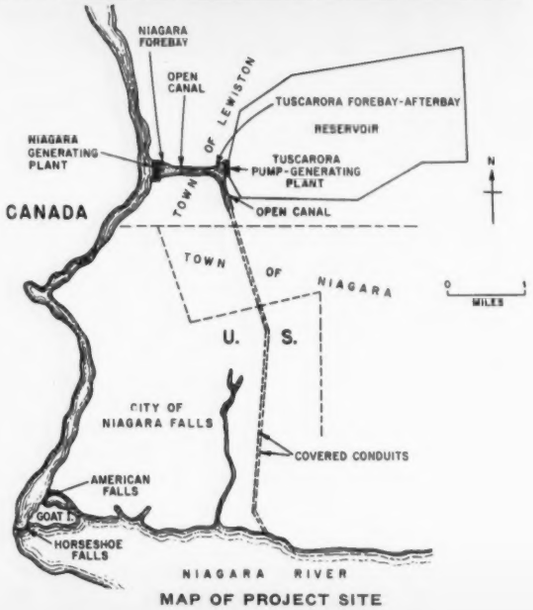
The base area where the wall section will be joined is first cleaned of debris with an air hose. This surface is next painted with an asphalt emulsion. Coils of sheet lead 1/16 inch thick, 2 feet wide, and 40 feet long are rolled out flat and cut into lengths of about 10 feet each. The purpose of this is to provide units easily handled by two men and short enough that damaging stresses will not be imposed in handling. A 10-foot length of sheet lead of this thickness and width weighs 80 pounds.

Strips of lead sheet are then placed over the base strip that was painted with asphalt emulsion. Then asphalt emulsion is painted over the lead to protect it from reaction with free lime in the fresh, curing cement. A gridwork of steel reinforcing bars is anchored in the rock wall. Finally, the mobile scaffolding rig is rolled up on the railroad tracks that run the length of the ditch, and another unit of concrete wall is poured.

Since the asphalt-lead-asphalt preparation is laid the length of both conduit trenches, on either side of each, 88,000 linear feet of lead sheet is required. Width of these strips is 2 feet, thickness 1/6-inch. Since sheet lead 1/16-inch thick weighs 4 pounds per square foot, lead requirement totals 352 tons.

Aerial view of big ditches, (Above) more than 100 feet in depth throughout, in which great concrete conduits are being formed that will convey water into forebay-afterbay. (Below) Conduit portable forms rolled into position by rail. Concrete pour is from ladle at left, suspended from crane, and this section of wall is finished.





MAP OF PROJECT SITE

Specification of lead

Lead was specified for its malleability and lack of resilience. Several other materials might have competed successfully if these properties had been the only criterion. The properties giving lead its greatest margin of preference, in this instance, are its lubricity and ability to carry heavy loads.

The joints where it is being used will be buried more than 100 feet below ground. The conduits are designed to serve under enormous stresses for decades, at least, probably for centuries. Maintenance economy has a premium value in this instance.

Its low cost and the ease with which it is cut and worked are other points given in its favor. This use of sheet lead as a sort of gasket permits it to act both as a water seal and as a lubricant. This lead gasket is being placed at the base and the vertical members of the two concrete conduits, each of which is more than four miles long.

Path of diverted water

The diverted water will emerge from the covered conduits to pass through a short stretch of open canal, still moving in a northerly direction, then flow into an open body of water having approximately the configuration of a two-headed wrench and oriented along an east-west axis.

The eastern bay will serve as both forebay and afterbay (or tailrace) for the Tuscarora Plant, its function dependent on whether the plant is operating as a pumping station or as a generating plant.

At night and at other times when a copious supply of water is alloted for power purposes and consumer requirements for power are diminished, the Tuscarora Plant will pump excess water up into the Tuscarora Reservoir, to a mean level 80 feet above the forebay—afterbay. When power demand is increased and the supply of diverted river water limited, the Tuscarora pumps will operate as turbines, and the Tuscarora motors will function as generators. Each of the 12-pump-turbine, motor-generator units at this plant will be rated at 20,000 kilowatts.

All the diverted water will finally be cascaded through the main Niagara Generating Plant, including that sidetracked into the reservoir enroute. Through this main plant, the water will give up a head of 305 feet to produce 2.6 million horsepower.

The Tuscarora Pumping-Generating Plant will be 974 feet long, 160 feet high. The Tuscarora plant will consume 582,000 cubic yards of concrete. The Niagara Plant will require excavation of 9.7 million cubic yards of rock and earth, and consume 1.1 million cubic yards of concrete and 53,000 tons of steel. The Niagara Plant will be 1,530 feet long and 389 feet high.

The entire project will require excavation of 39 million cubic yards of rock and earth and will consume 3.5 million cubic yards of concrete and 355 million pounds of structural and reinforcing steel.

PRODUCTS, EQUIPMENT, MATERIALS

Report of recent developments by industry, based on data furnished by mfrs. Inquiry cards for further information face pages 1 and 64.

DRAPERY FABRICS HAVE GEOMETRIC DESIGNS

MFR'S DESCRIPTION: collection of drapery fabrics announced, featuring geometric design elements.

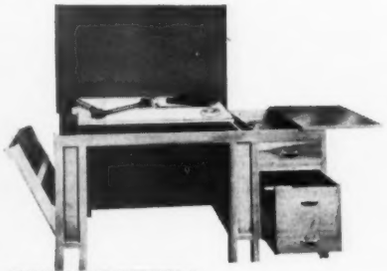
USES: in residences and offices.

SPECS/FEATURES: collection of fourteen selections, designed by Alexander Girard, AIA, features *Plusses, Small Triangles* and *Pumpkin Seeds* (shown). Latter is designed for ochre dark, black or orange dark on ecru linen and yellow on white Fortisan Bemberg sheer. Linen is woven in Belgium. Pattern intended to form meaningful contrast against predominant angular architectural shapes.

AIA FILE NO. 28-D

MFR: HERMAN MILLER FURNITURE CO.

Circle 200 for further information



DESK/DRAFTING BOARD COMBINATION

MFR'S DESCRIPTION: *Drawing Chief* desk announced, designed to serve as standard executive desk and drawing table.

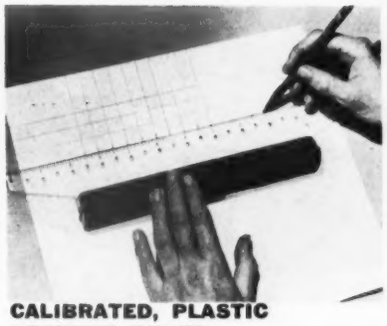
USES: home or office use.

SPECS/FEATURES: drawing board is concealed under desk top and elevated into posture chair height by a raising mechanism when desk top is opened. When top is closed, board is automatically lowered into a well with sufficient clearance to permit permanent mounting of drafting equipment. Clearance said to eliminate necessity of removing tools or reference books from surface. Storage facilities provided for drawings, paper, books and files. Available in varied styles, desk top sizes, electrical outlets and locks.

AIA FILE NO. 35-H-41

MFR: DENSMORE CALCULATOR CO.

Circle 201 for further information



CALIBRATED, PLASTIC DRAWING RULER

MFR'S DESCRIPTION: plastic 12" combination triangle, T square and parallel ruler, of West German manufacture, introduced.

USES: drafting aid.

SPECS/FEATURES: said to be simple answer to drawing horizontal, vertical and angular parallel lines in automatically measured distances rapidly. Unit features built-in rollers to allow smooth movement up or down when drawing lines. Spiral index window utilized to automatically indicate distances between horizontal lines as close as 1/16". Price is $3.95.

AIA FILE NO. 35-H-3

MFR: ROL-RULER CO.

Circle 202 for further information

INNOVATIONS IN BATHROOM DESIGN

MFR'S DESCRIPTION: research bathroom developed, employing modified fixtures and design innovations.

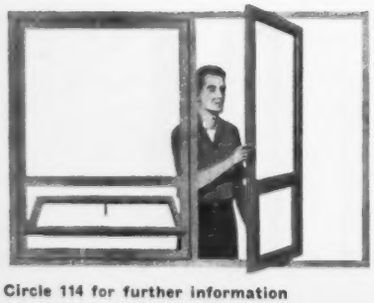
USES: large or small residential bathrooms.

SPECS/FEATURES: intended to provide look into the future, bathroom includes full bath, lavatory, toilet and storage space. Fixtures, such as *Contour* bathtub, wall-hung toilet, counter top lavatory and storage cabinet, are modified and coordinated to maintain design integrity and provide greater utility, according to mfr. Bathtub is installed behind moving translucent doors which extend to above shower head. Plumbing mechanisms are accessible through removable front panel on cabinet component. Lighting coves are installed above and below medicine cabinet to provide indirect illumination. Mfr claims entire structure gives integral appearance.

AIA FILE NO. 29-H

MFR: PLUMBING & HEATING DIV., AMERICAN-STANDARD

Circle 203 for further information



With Michaels' Aluminum Vertically Pivoted Window (VPA-1), the outside can be cleaned from the inside – quickly, safely. Unlocked with a key, the window pivots 180° and automatically relocks for washing. Then, the window unlocks, pivots 180° and locks once more at the original position. Equally suitable for masonry or metal wall construction, the VPA-1 is weather-tight and guaranteed. Details on request.

M
A B C

THE MICHAELS ART BRONZE CO., P.O. Box 668, Covington, Ky.

Circle 114 for further information

PRODUCTS, EQUIPMENT, MATERIALS

RECORDING INSTRUMENT INTRODUCED

MFR'S DESCRIPTION: *Aristo Polar Planimeter* is compensating planimeter, said to be simple, sturdy, speedy and accurate.

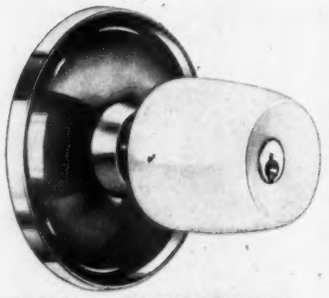
USES: determining areas of irregular plane figures on maps, drawings, plans, etc.

SPECS/FEATURES: unit has built-in recording system for protection against accidental damage and dust. Parallelity of tracer arm and wheel axle is adjustable, mfr claims. Vernier reads to four digits. Instrument has either fixed or adjustable tracer and pole arms. Variety of attachments available, including, tracing and reading magnifiers, polar disc and pole wagon for conversion to linear rolling planimeter.

AIA FILE NO. 35-N-8

MFR: EPIC, INC.

Circle 204 for further information



MATERIALS, COLORS ADDED TO DECORATIVE LOCKS

MFR'S DESCRIPTION: *Delrin* knobs and *Fired Copper* roses added to decorative trim of architectural lock line.

USES: executive offices, reception rooms, residential doors and others.

SPECS/FEATURES: materials and colors available for *IntegraLock*, *MagnaLock*, *MortiseLock* and *SentryLock* models. *Delrin*, material by Dupont, said to offer smooth, hard surface, resistant to stain, scratch, chip, corrosion, moisture and electricity. Knobs available in two designs, in three colors. Roses offered in five color combinations. Off-white *Delrin* knob with *Fired Copper* rose is illustrated.

AIA FILE NO. 27-B

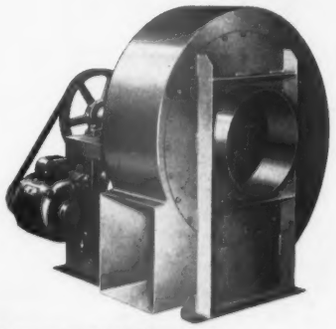
MFR: SARGENT & CO.

Circle 205 for further information

SCHOOL COMMUNICATION SYSTEM INTRODUCED

MFR'S DESCRIPTION: school communication system, *SS4000 System*, introduced, providing five simultaneous

channels of communication.
USES: school applications.
SPECS/FEATURES: system utilizes transistorized components; provides two sound channels, electronic voice intercom, room-to-room telephone facilities and time and alarm signals, according to mfr. Feature of unit is miniaturized multiple time channel pegboard for tying-in classrooms with any one of six programs of time signals. Miniature unit is built into classroom selector panel, mfr states, requiring no extra housing. Control center reportedly may be located in general office or elsewhere in school.
AIA FILE NO. 31-i-7
MFR: EXECUTONE, INC.
Circle 206 for further information



INDUSTRIAL FAN LINE INTRODUCED

MFR'S DESCRIPTION: line of gas, fume and materials handling fans introduced, in three wheel designs.
USES: industrial applications.
SPECS/FEATURES: three wheel designs offered for handling gases, corrosive fumes, granular or fibrous materials. All wheel sizes from 19⅛" to 64⅜" available. Range of 11 inlet sizes from 11" to 37" and five arrangements offered, to meet needs of many industrial processes. Wheels are electronically balanced; fans have heavy-duty ball bearings and close tolerance shafts for efficient, smooth operation. Material handling wheels are designed to simplify field repair, according to mfr.
AIA FILE NO. 35-i-1
MFR: THE TRANE CO.
Circle 207 for further information

SELF-LOCKING CASEMENT WINDOW

MFR'S DESCRIPTION: casement window with single operation control to regulate opening, closing and locking.

Circle 115 for further information →

DESIGN—Clean, modern, practical with coved corners and dished bottoms makes them highly functional and attractive plus blending with all laboratory furniture.

CORROSION RESISTANCE — Made of modified epoxy resin, Durcon exhibits almost complete resistance to wide range of acids, alkalies, salts, solvents, and other organic chemicals.

WIDE SELECTION—Table sinks, end sinks, drainboard-sink units, double compartment sinks, cylindrical sinks, cup sinks.

LIGHT WEIGHT— Approximately 40% as heavy as competitive sinks. Normally thickness of stone or porcelain sinks is at least 1" while Durcon is but ½" thick.

LOWER COST—Besides lower initial cost, there are savings on freight and installation.

EASIER INSTALLATION— One man can easily install a Durcon sink either under table top or free standing. No hydraulic jack required as for ceramic or stone sinks. Less weight means less complicated supports.

HEAT RESISTANCE — Unlike other plastic laboratory sinks, Durcon will not warp nor soften when exposed to boiling solutions. Neither will Durcon support combustion.

SHOCK RESISTANCE— No failure due to thermal shock need be feared. Wide range of tests also assure many years' service without cracking, spalling or other forms of mechanical or fatigue failure.

MOISTURE ABSORPTION— Durcon sinks are impermeable to liquids. The percentage of moisture absorption over an extended period is a maximum of 0.06%.

unusual test, but

Durcon®

Laboratory Sinks took it!

To prove ruggedness of Durcon Laboratory Sinks, one laboratory conducted a test, admittedly unusual, in which steel horseshoes were pitched at and into the sink from a distance of thirty feet. The sink survived with only a few scratches which were quickly smoothed out with emery paper and an oily cloth.

Of course, seldom will horseshoe pitching be practiced in laboratories, but this is only one of a wide range of tests that have proven that Durcon Lab Sinks, made of epoxy resin modified by the Duriron Company, will provide years of service. No cracking, no spalling nor other forms of mechanical failure.

Why not take a look at the many other good reasons why you should specify Durcon Lab Sinks. For further information and prices, contact your Laboratory Furniture Manufacturer, or write for new Bulletin PF/5a.

THE DURIRON COMPANY, INC.
DAYTON, OHIO

DRAFTING TRENDS

A GLUTTON FOR PUNISHMENT. *The image, pencil or ink, on POST Polytex stays put. Won't rub, flake or peel off accidentally, yet can be erased. Duralar pencil lines bond to the surface readily. Soiled originals can be washed with water and detergent!*

New POST-perfected Polytex takes pen or pencil perfectly

TAPE TEST *proves remarkable adhesion of inked lines to the surface of POST 126 Drafting Film, lines which do not feather out or spread.*

You already know that drafting films offer the advantages of tremendous durability and dimensional stability. Now, thanks to an exclusive, precision process, POST offers a drafting film with superlative drafting characteristics. The surface of POST 126 Polytex is unmatched for ink receptivity, has a coating that stands up, erasure after erasure. Ink lines won't pull off when cellophane tape is applied firmly over them and then suddenly yanked off. Transparency is excellent.

If you prefer pencil, use a POST Duralar lead for permanence. Plastic-based Duralar lines actually bond themselves to the Polytex surface. Drawings won't easily smudge or smear . . . can even be washed with soap and water.

By using new Polytex, with DuPont Mylar base, you avoid the drawbacks which show up in some films . . . a drawing surface too slick to retain a pencil or pen line . . . too soft for use with hard pencil after erasures.

Enjoy the flexibility and long life of a drafting film with an ideal drafting surface. Try new 126 Polytex Drafting Film.

For a test sample and more information, see your local POST Blueprinter, or write Frederick Post Company, 3654 N. Avondale Avenue, Chicago 18, Illinois.

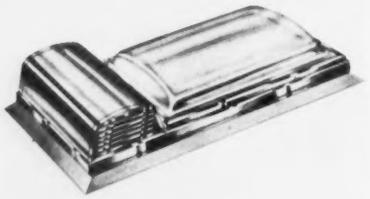
POST

SENSITIZED PAPERS & CLOTHS • TRACING & DRAWING MEDIUMS • DRAWING INSTRUMENTS & SLIDE RULES
ENGINEERING EQUIPMENT & DRAFTING SUPPLIES • FIELD EQUIPMENT & DRAFTING FURNITURE

Circle 116 for further information

PRODUCTS, EQUIPMENT, MATERIALS

USES: residential installations.
SPECS/FEATURES: said to allow maximum light and ventilation, units feature friction-free vinyl weatherstripping and concealed hinge device, in addition to self-locking feature. Units are equipped with standard screens mounted on inside for maintenance ease and either single-strength or double-panel insulating glass, bedded in mastic compound which functions as seal. Available in ten sizes. Wood parts are treated to resist moisture and decay.
AIA FILE NO. 16-L
MFR: R. O. W. SALES CO.
Circle 208 for further information



SKYLIGHTS/SKYLIGHT VENTILATOR UNITS

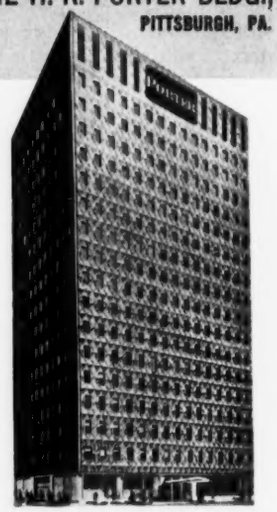
MFR'S DESCRIPTION: *Astro-Lites*, line of skylights, and *Astro-Vents*, companion series of skylight-ventilators, said to be first dual purpose units suitable for heavy duty requirements, introduced.
USES: commercial, institutional and industrial applications.
SPECS/FEATURES: skylights consist of one-piece acrylic resin dome and aluminum frame for installation in self-flashing, insulated curb. Furnished with clear dome material or translucent material; both said to provide excellent light diffusion and negligible heat gain or loss. Companion unit consists of skylight as described, plus separately housed ventilator, both mounted on single extruded aluminum frame which fastens to curb. Use of units said to preclude any other ventilation.
AIA FILE NO. 12-J
MFR: JENN-AIR PRODUCTS CO., INC.
Circle 209 for further information

LIGHTING

MODULAR LUMINOUS CEILING UNITS

MFR'S DESCRIPTION: *Modernlite* luminous ceiling introduced.
USES: residential installations.
SPECS/FEATURES: reported to be lightweight, easy to install and remove for cleaning purposes and features

Perlite
adds fire protection and durability to the curtain wall construction in
THE H. K. PORTER BLDG., PITTSBURGH, PA.



Reflecting the fast-growing acceptance, by leading architects and builders, of Perlite Insulating Concrete, is the modern H. K. Porter Building . . . one of Pittsburgh's newest skyscrapers. The pleasing appearance of the metal "skin" panels has the advantage of fire safety, lightweight strength and durability provided by Perlite Insulating Concrete backup.

Perlite Lightweight Insulating Concrete offers advantages of fire safety, strength, durability and insulation.

WANT TO KNOW MORE about the advantages of Perlite Insulating Concrete? Write today for A.I.A. file 3-D-3 and complete information. Perlite is also available in Canada.

Perlite INSTITUTE INC.
45 WEST 45TH ST., NEW YORK 36, N. Y.

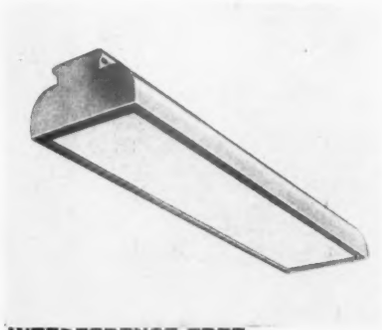
Circle 117 for further information

dust-shedding plastic louvered grillwork. Mfr states units are economically priced, prefabricated in 4′ x 4′ and 4′ x 6′ modular units. Each unit features louvered grillwork trimmed with natural or gold anodized aluminum. May be installed on existing outlets, according to mfr.

AIA FILE NO. 31-F-231

MFR: STA-BRITE FLUORESCENT MFG. CO.

Circle 210 for further information



INTERFERENCE-FREE FLUORESCENT LIGHTS

MFR'S DESCRIPTION: radio interference-free fluorescent light fixtures available.

USES: electronic laboratories and screen rooms, mobile communications vans, and similar locations requiring excellent illumination free from spurious electrical noise.

SPECS/FEATURES: fixtures use standard fluorescent lamps mounted within electrically shielded enclosures. Key to shielding is heat-resistant, borosilicate glass lens to one side of which is permanently bonded a light transparent, electrically conductive film. Gold grounding strip, ¼″ wide, around periphery of glass panel facilitates trouble-free electrical bond. Combination of coated panel and shielded enclosure stated to eliminate interference in frequency range of 0.014 to 25.0 megacycles, while integral line filter eliminates conducted interference.

AIA FILE NO. 31-F-29

MFR: ENDER-MONARCH CORP., DIV., ACOUSTICS ASSOCIATES, INC.

Circle 211 for further information

VAPOR PROOF LIGHTING UNITS

MFR'S DESCRIPTION: complete line of *Vaportite* industrial lighting fixtures, with or without porcelain reflectors, announced.

USES: industrial locations.

SPECS/FEATURES: units feature all aluminum die cast bodies and guards, engineered to permit relamping and cleaning without use of tools. Available in 100 or 200 watt types for pendant, wall or ceiling mounting. Wall and ceiling units are attached to outlet box cover or to cast aluminum box having four ½″ or ¾″ tapped hubs; fifth hub in back can be tapped if specified, mfr states. Aluminum parts have baked finish to protect against chemical fumes, caustics, etc. Globes are heat-resistant, available in clear or choice of four colors.

AIA FILE NO. 31-F-28

MFR: STEBER MFG. CO.

Circle 212 for further information

ELECTROLUMINESCENT NIGHT LIGHT

MFR'S DESCRIPTION: *Panelescent* night light introduced, employing principle of electroluminescence or direct conversion of electrical energy into light.

USES: nurseries, bedrooms, bathrooms and hallways.

SPECS/FEATURES: unit plugs into standard 120 volt outlets; is said to burn for a year on less than three cents worth of electricity and to have life expectancy of almost five years of continuous burning. Utilizes thin ceramic plate coated with electroluminescent phosphors. Reported to meet UL requirements. Material also available in panel form, up to 24″ x 36″, for use as highway markers, instrument dials and others.

AIA FILE NO. 31-F

MFR: SYLVANIA LIGHTING PRODUCTS, DIV., SYLVANIA ELECTRIC PRODUCTS, INC.

Circle 213 for further information

SHALLOW LUMINAIRE UNIT OFFERED

MFR'S DESCRIPTION: *6000 Series* luminaire offered, featuring crystal-clear, acrylic, prismatic *Controlens*.

USES: interior applications.

it's new—it's a Halsey Taylor

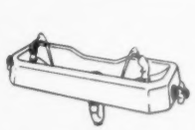
No. 5907 "ALL-CLIMATE" Outdoor Fountain
Patent Pending

An Outdoor Wall Fountain with Superior All-Weather Features

This new Halsey Taylor All-Climate Outdoor Fountain has exclusive all-weather features for outdoor use. Automatic frost-proof supply valve and drain assembly provide complete drain-back into cabinet in rear of wall. Valve extensions can be made to exact wall thickness. All exposed fittings chromium plated.

See Sweet's or the Yellow Pages

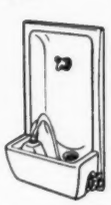
The Halsey W. Taylor Co., Warren, O.



Battery Wall Fountains

601

Pedestal Fountains



Recess Wall Fountains

Circle 118 for further information

Some architects, like the GREEKS, are partial to curves

If you have some large ceiling areas where monotony could be detrimental, here's a trick today's architects are borrowing from the classic Greek architects. Specify Corning Pattern No. 74, a crystal lens panel that introduces some interesting curves. This sectional drawing shows what we mean.

We recommend these panels for installation in conference rooms, executive offices and other places where high efficiency and low brightness alone aren't enough . . . where the subtlety of curvature adds just a touch of distinction. For complete data, write Lighting Sales Department, 8 Crystal Street, Corning, N. Y.

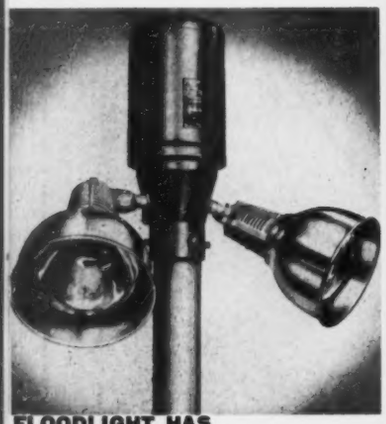
CORNING GLASS WORKS

CORNING MEANS RESEARCH IN GLASS

Circle 119 for further information

PRODUCTS, EQUIPMENT, MATERIALS

SPECS/FEATURES: unit is $3\frac{13}{32}$" deep to ceiling line. Each of two lenses is made of one single injection molded piece 4' long. Lenses reportedly are held entirely without any visible frame and are separated along center of fixture by 3" wide ballast chamber cover recessed 1" above bottom of lens. End plates stated to be wafer-thin, die-cast of zinc.
AIA FILE NO. 31-F-23
MFR: HOLOPHANE CO., INC.
Circle 214 for further information



FLOODLIGHT HAS EFFECTIVE WEATHERSEAL

MFR'S DESCRIPTION: mercury vapor floodlight announced with more effective weatherseal.
USES: outdoor areas which demand weatherproof units.
SPECS/FEATURES: unit features patented, full-floating socket construction which is said to adjust automatically to variations in lamp sizes and shapes, to insure perfect weatherseal with all makes of R-60 reflector lamps, mercury vapor in 400 watt size, and 750-1,000 watt incandescent. Socket is mounted on compression spring to help eliminate excessive vibration, shock, pole whip, arcing, socket corrosion and water seepage. Recommended for use with high output, sealed beam mercury vapor lamps for large scale lighting of sport and recreation areas, construction sites, etc. Fixtures are ventilated.
AIA FILE NO. 31-F-22
MFR: STONCO ELECTRIC PRODUCTS CO.
Circle 215 for further information

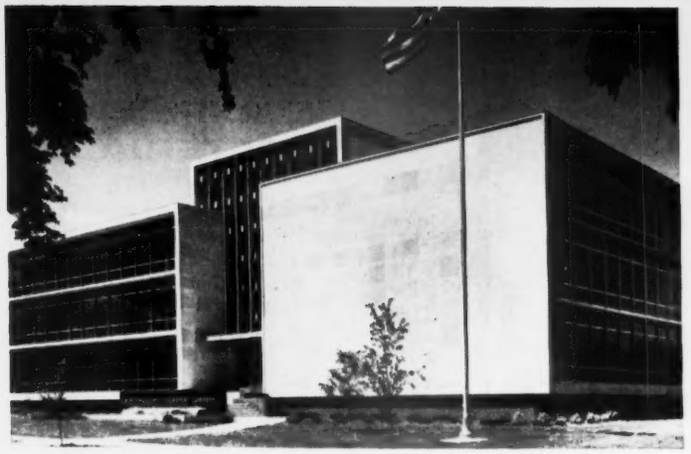
ADDITIONS TO FIXTURE LINE

MFR'S DESCRIPTION: two lighting units added to interior fixture line.
USES: commercial and residential

Circle 120 for further information →

More than 1800 fluorescent fixtures in Old American's new building help create this striking nighttime impression.

110 footcandles of glare-free illumination are maintained throughout, including this attractive lounge for employes.



How Old American Insurance Co. ended the great lighting search with Day-Brite

True to Missouri tradition, Old American Insurance Co. adopted a "Show Me" attitude when considering lighting for their new Kansas City headquarters.

They contacted their local power and light company engineers. Consulted the experts at General Electric's famed Nela Park. Even made their Addressograph Department a "lighting laboratory" and installed competitive fixtures side-by-side.

Result? For lighting effectiveness with high visual comfort, over-all economy with trouble-free maintenance, and pleasing appearance, Day-Brite lighting was the clear-cut choice.

May we show *you*? Call your Day-Brite representative, listed in the Yellow Pages, for the FACTS and FIXTURES! *Day-Brite Lighting, Inc., St. Louis, Mo. and Santa Clara, Calif. In Canada: Amalgamated Electric Corp., Ltd., Toronto 6, Ont.*

Modular design, incorporating Day-Brite Mobilex® with Cleartex® enclosures, permits complete flexibility in arranging offices and work areas.

DAY-BRITE

NATION'S LARGEST MANUFACTURER OF COMMERCIAL AND INDUSTRIAL LIGHTING EQUIPMENT

products equipment materials

lighting applications.
SPECS/FEATURES: *Ellipse* is availab in either pendant or surface style, 14", 18" and 22" globes. Hand blow opal glass said to provide soft dow ward and upward illumination. Pi and trim are satin-brushed alum num. *Pendant Sphere* is similar uni available in 12", 14", 16" or 18" glol sizes. Functional design and vers tility of fixtures stressed.
AIA FILE NO. 31-F-23
MFR: HALO LIGHTING PRODUCTS, IN
Circle 216 for further information

COMPACT EXIT LIGHT FIXTURE
MFR'S DESCRIPTION: *Wafer Thin 5* line of exit lights introduced, de scribed as compact, code-regulate unit.
USES: office buildings, hotels, school hospitals, libraries, theaters an other public locations.
SPECS/FEATURES: unit features a cast aluminum construction wit stenciled face or glass inscriptio panels, two-circuit wiring for eithe incandescent or fluorescent lamps for 120 or 277 volt systems and in tegral downlight, providing illumina tion of doorway in case of an emer gency. Internal cast hinge-and-loc said to eliminate all external hard ware. Designed for surface, wall ceiling, pendant, extended bracket o recessed mounting.
AIA FILE NO. 31-F-27
MFR: MC PHILBEN LIGHTING, INC.
Circle 217 for further information

MERCURY LAMP BALLAST OFFERED
MFR'S DESCRIPTION: high-tempera ture, mercury-lamp ballast, designe for high-bay lighting applications introduced.
USES: with mercury lamps in stee mills, foundries, forge rooms, etc.

← Circle 120 for further information

to control any door...

russwin doorware

The Russwin 400 closer — Strongest closer ever built with full-time power control. Adjusts for speed, latching and silent closing. Also available: "delayed action" control, hold-open arm and fusible link. Mortise or surface installation. For further information write Russell & Erwin Division, The American Hardware Corporation, New Britain, Connecticut.

Circle 121 for further information

planning a school or library?

get help from these 2 STACOR equipment catalogs

They show space-saving, economical, attractive units . . . ways in which to use them . . . features that have made the Stacor name famous for well designed, well made, well accepted equipment.

WRITE, WIRE, PHONE FOR YOUR COPIES TODAY.

STACOR EQUIPMENT CO

Manufacturers of Lifetime Quality Drafting Equipment for Schools, Libraries & Industry

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Circle 122 for further information

PRODUCTS, EQUIPMENT, MATERIALS

SPECS/FEATURES: mfr states units can be mounted in areas that have much higher than normal ambient temperatures. Designed to operate successfully at rated capacity for normal life expectancy, even when running continuously in ambient temperatures as high as 150°F, according to mfr. Units are intended for proper lamp starting in ambient temperatures of 35°F to 150°F. Have minimum power factor of 90 per cent; are available for use with 400 and 1,000 watt single and two-lamp applications.

AIA FILE NO. 31-F

MFR: GENERAL ELECTRIC CO.

Circle 218 for further information

CHANDELIERS AND DECORATIVE FIXTURES

MFR'S DESCRIPTION: decorative models added to *Portfolio* line of chandeliers and lighting fixtures.

USES: interior, residential uses.

SPECS/FEATURES: designed by Maurizio Tempestini, Carl Moser and Gerald Thurston, units employ materials such as hand-cut crystal and delicate blown glass from Europe, woods from the Far East and plastics and metals from the United States. Group includes: *Carnival* pendants and spreaders (shown); *Interplay* chandeliers; *Mozart* crystal chandeliers; and *Bouquet* close-to-ceiling fixtures.

AIA FILE NO. 31-F-23

MFR: LIGHTOLIER, INC.

Circle 219 for further information

HVAC

WATER-TO-AIR HEAT PUMP

MFR'S DESCRIPTION: water-to-air heat

Aren't You Entitled to the Best?

If you were a doctor, you wouldn't use a cheap stethoscope. If you were a violinist, you wouldn't think of playing a concert on a scratchy fiddle.

As a man of standing in your profession—you, too, are entitled to the best. It doesn't make sense to settle for a cheap lead holder, the most important, the most used tool in your profession, whether you are an engineer, designer, draftsman or architect.

A.W.Faber Locktite 9800 is not a luxury. It is a necessity. It is the ultimate means by which you translate your creative skills. It is the bedrock of your ability, the criterion of your worth—the direct influence of your livelihood—and the index of your future success. In the light of these values, can you afford to use a less-than-best lead holder?

Only Locktite 9800 has all of these exclusive advantages:

- **Long tapered spiral metal grip that reduces finger fatigue.**
- **Gun-rifled clutch that grips the lead like a bulldog.**
- **TEL-A-GRADE indicator which instantly shows degree of lead in use.**

Plus perfect balance and featherweight lightness.

Try Locktite, buy Locktite 9800 today, the top quality lead holder backed by two centuries of experience.

FULLY GUARANTEED!

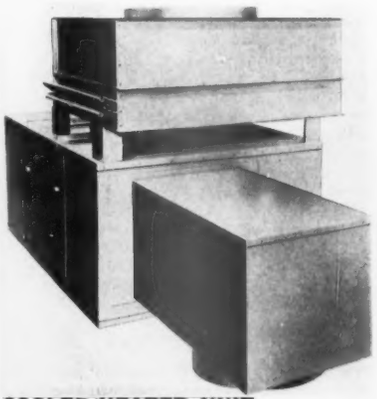
If it ever happens, that any part of a LOCKTITE Holder breaks in normal usage, the entire holder will be replaced free of charge.

#9030 Imported CASTELL Black Gold Refill Leads fit any standard holder. Perfectly mated with LOCKTITE. Sold by all good Dealers.

A.W.Faber-*Castell* Pencil Co., Inc., Newark 3, N. J.

Circle 123 for further information

pump introduced to provide automatic, clean heating or cooling comfort.
USES: air-conditioning offices, stores, restaurants and homes.
SPECS/FEATURES: units available in five sizes from 3, 5 and 7½ tons single compressor units to 10 and 15 dual compressor units. Heating capacities range from 49,000 to 206,000 btu/hr. Mfr stresses unit's quiet operation, low cost installation, full range temperature controls, maximum heat transfer, rugged construction and maintenance ease.
AIA FILE NO. 30-C-15
MFR: THE TRANE CO.
Circle 220 for further information

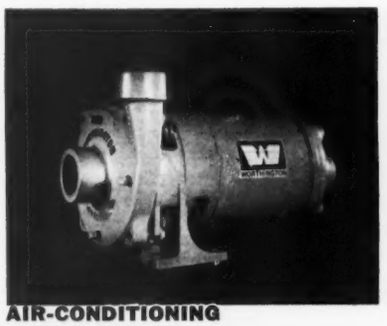


COOLER/HEATER UNIT IS ROOF-MOUNTED

MFR'S DESCRIPTION: 10-ton packaged, air-cooled, air conditioner and gas-fired heater combination, designed for roof mounting, introduced.
USES: commercial and industrial buildings.
SPECS/FEATURES: mfr claims significant economies in installation, operation and maintenance. Because it is roof-mounted and air-cooled, it is said to free floor space for other purposes and eliminate maintenance generally encountered with water towers, pumps and piping of water-cooled systems. Unit, providing 240,000 btu/h, reported to be particularly suitable for shopping center stores, super markets and similar one-story structures. Unit consists of cooling system, gas-fired heating unit, air filters, blowers and controls. Measures 90" x 60", and is 80" high; weight is 2,750 lbs.
AIA FILE NO. 30
MFR: TYPHOON AIR CONDITIONING DIV., HUPP CORP.
Circle 221 for further information

DIRECT-FIRED HEATING/COOLING UNIT

MFR'S DESCRIPTION: direct-fired, 25-ton, absorption cooling-heating unit developed.
USES: heating and cooling applications.
SPECS/FEATURES: model *DF-3000* stated to be first medium and large-tonnage absorption unit ever to provide both cooling and heating. Also reported to eliminate need for steam boilers, condensate pumps and steam and condensate piping, enabling relatively simple and economical installation. Mfr claims unit operates without any mechanical purge or circulating pumps or compressors. Has total refrigeration capacity of 300,000 btu/h; and heat capacity of 400,000 btu/h; is 104" wide, nearly 84" high and 39½" deep. To be offered in range of capacities from 3½ to 25 tons.
AIA FILE NO. 30-L
MFR: ARKLA AIR CONDITIONING CORP.
Circle 222 for further information



AIR-CONDITIONING PUMP LINE

MFR'S DESCRIPTION: *Econobloc* line of air-conditioning pumps introduced.
USES: commercial installations.
SPECS/FEATURES: available in six sizes, in fractional hp range. Said to deliver up to 20 gals/min and heads to 110'. Reportedly feature higher efficiencies, reliable and easily replaceable mechanical seal and space-saving compactness of design. Die cast aluminum bronze impellers with shell-molded casings insure smoother waterways, according to mfr.
AIA FILE NO. 30-C-5
MFR: WORTHINGTON CORP.
Circle 223 for further information

CONDENSING UNITS AIR-COOLED

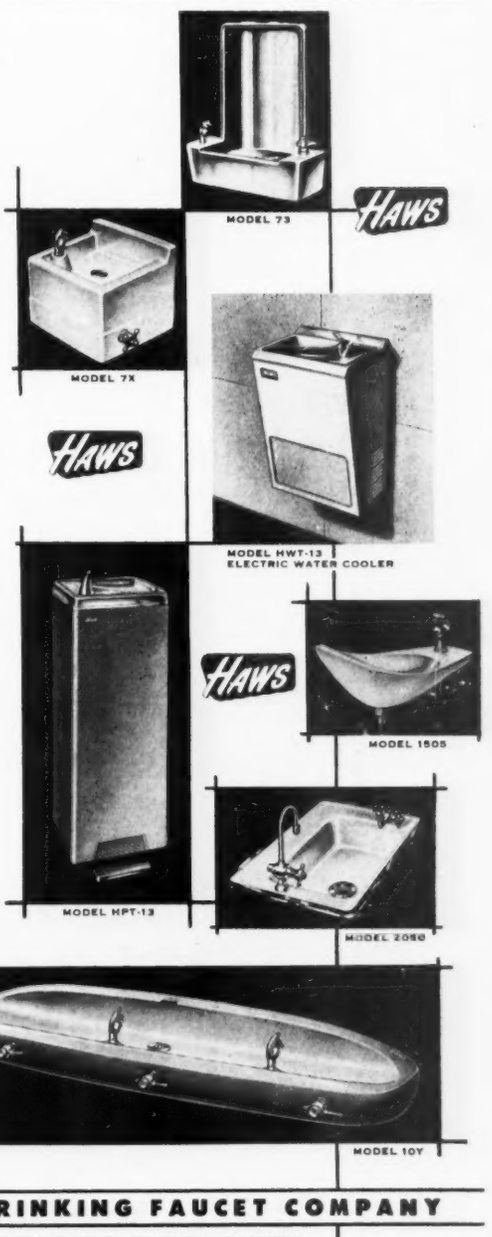
MFR'S DESCRIPTION: three remote, high-capacity, air-cooled condensing units now available.
USES: commercial and large residential cooling applications.
SPECS/FEATURES: models *61-RCD* and *63-RCD* feature 5 ton capacity using 6½ hp compressor; model *83-RCD* has full 7½ ton capacity using 8¾ hp compressor. Other features include: flexible design to permit use either inside or outside a building; remote operation to distances of 85'; built-in compressor-compartment heater; condenser motors with ceramic type insulated windings; and unusually low decibel characteristics to reduce noise.
AIA FILE NO. 30-F-3
MFR: TUCK-AIRE FURNACE CO.
Circle 224 for further information

ELECTRIC, FAN-FORCED UNIT HEATERS

MFR'S DESCRIPTION: line of electric, heavy-duty, fan-forced unit heaters introduced, designated *Heetaires* (*Series 600.*)
USES: industrial, commercial and retail establishments.
SPECS/FEATURES: stainless steel finned sheath heating element said to be heart of line. Capacities range from 2 KW to 10 KW, with 208, 240, 480 and 575-volt in single and three-phase types, with either built-in or remote thermostat controls. Units designed to be either suspended from ceiling or wall, or used as portables.

SPECIFY WITH CONFIDENCE

You are sure of permanent satisfaction when you specify HAWS—for 50 years the pace-setter in developing better materials, design and skilled workmanship. You seek drinking facilities that will do credit to your design achievements, and yield the utmost in sanitation and service. To realize these aims...specify HAWS with confidence.



Semi-Recessed Model 73, in stainless steel; similar models in vitreous china, porcelain enameled steel.

Model 7X, enameled iron, wall mounted; freeze-proof valve assembly available.

HAWS Electric Water Coolers in full range of capacities and styles; floor and wall models for commercial, industrial and private uses. Restaurant and cafeteria types, remote coolers, wall insert units.

Cantonment type Model 1505 typifies HAWS dramatic styling achievements.

Deck-Type Fountains in enameled iron and stainless steel, may be equipped with a wide selection of HAWS faucets and fixtures. Popular units for classrooms and commercial operations.

Model 10Y, multiple fountain in colorful fiberglass plastic; available also in acid resisting enameled iron (Model 10X).

HAWS DRINKING FAUCET COMPANY
1441 FOURTH STREET • BERKELEY 10, CALIFORNIA

Circle 124 for further information

to control interior doors...

russwin doorware

The Russwin Top-Railer Closer — Engineered to Russwin 400 Closer standards. Dual controls for closing and latching speeds . . . separate control for cushioned back-check and hold-open. One location for all doors. For further information write Russell & Erwin Division, The American Hardware Corporation, New Britain, Connecticut.

Circle 125 for further information

yours FREE...the NEW
1960 RLM specifications book for
industrial lighting equipment brings you
New and Upward Revised Standards

BUT...

REMEMBER THIS IMPORTANT FACT! This new edition announcement again emphasizes the fact that RLM Specifications are not fixed standards! They are Quality Standards that grow with the Industry and the Science of Illumination. For your new, complimentary copy of the 1960 RLM Specifications Book, write RLM STANDARDS INSTITUTE, 326 W. Madison St., Dept. 8376 Chicago 6, Illinois.

RLM THE FINAL INGREDIENT OF BEING SURE

Circle 126 for further information

861

PRODUCTS, EQUIPMENT, MATERIALS

Elements consist of helically-coiled, nickel-chromium alloy resistance wire embedded in magnesium-oxide, enclosed swedged into stainless steel sheaths to which stainless steel fins are permanently braised. Mfr states decreased noise levels are maintained because axial-flow, propeller type fans do not labor against high static pressures. Heating elements, motors, blades and all internal controls said to be mounted on heavy gauge steel chassis to which is attached a case covering all components. Described as UL and CSA approved.

AIA FILE NO. 30-C-43

MFR: MARKEL ELECTRIC PRODUCTS, INC.

Circle 225 for further information

SURFACE MOUNTED CEILING HEATER

MFR'S DESCRIPTION: *Model 9290,* radiant ceiling heater, introduced.

USES: heating applications.

SPECS/FEATURES: intended for ceiling mounting, unit reportedly extends only 3½" from ceiling. Grille pattern permits maximum heat radiation and diffusion with no drafts or cold spots, according to mfr. Quiet fan pulls air through center of unit and disperses infra-red heat around outer edge. Model stated to have armored-type heating element with almost instant heating action. All exposed parts are anodized aluminum.

AIA FILE NO. 30-C-44

MFR: NUTONE, INC.

Circle 226 for further information

FLOOR/CEILING UNITS

TILE AVAILABLE IN THREE GAUGES

MFR'S DESCRIPTION: *Vina-Lux 800 Series,* vinyl asbestos floor tile intro-

when you install
Josam SHOCK ABSORBERS

Water hammer in pipe lines can be noisy . . . disturbing . . . and continually destructive to pipe fittings, valves and gauges. When you install Josam Shock Absorbers, water hammer disappears . . . pipe lines become quiet as a kitten . . . and you get permanent protection against expensive shut-downs and repairs. A type and size for every water hammer condition. Get complete details by writing for free copy of Manual SA-2 today.

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JOSAM MANUFACTURING CO.
Dept. AN-6, Michigan City, Indiana
West Coast Distributors
JOSAM PACIFIC CO., 765 Folsom St., San Francisco, Calif.
REPRESENTATIVES IN ALL PRINCIPAL CITIES

Circle 127 for further information

AERO-BOARD

Air Powered Hydraulic DOCKBOARDS
IN NEW Construction or Remodeling

CUSTOM ENGINEERING SERVICE AVAILABLE
Freightliner will Custom Engineer AERO-BOARDS to FIT your capacity requirements and installation specifications.

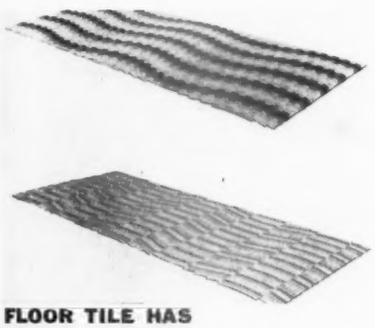
CHECK THESE ADVANTAGES:
Low Initial Cost • Inexpensive to Install and Operate • Stores Upright — out of the way • Manual-automatic-"Air-over-Oil" activated — from power supplied by air system standard on many docks • Safe — One Man Operation • No Electrical power required at dockboard • Standard, 10,000 lb. cap. model adaptable to most installations.
AERO-BOARD, ready to install.. $410.00
Write for your copy of the AERO-BOARD specification brochure. It includes detailed AERO-BOARD specifications, photos, installation diagrams, air compressor requirements, name of local supplier.

AERO-BOARDS are sold and serviced by Leading Materials Handling Equipment Distributors.

Mfd. by FREIGHTLINER CORPORATION Dept. 6B, Box 3591 Portland 8, Oregon

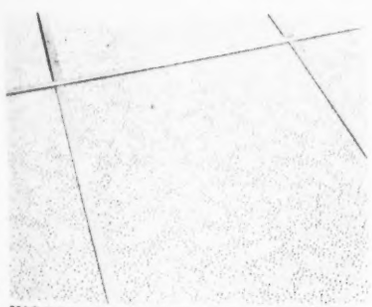
Circle 128 for further information

duced in 1959, now available in 1/16" and 3/32", as well as 1/8" gauges.
USES: heavy traffic institutional, commercial, residential and industrial floor areas.
SPECS/FEATURES: series features color styling distributed through full thickness of tile. Gauges added to meet requirements of light commercial and residential floors, according to mfr. Available in six colors. Size is 9" x 9"; can be installed over concrete, on, above or below grade, or on felt over wood subfloors. Reportedly is greaseproof, alkali resistant and economical to maintain.
AIA FILE NO. 23-G
MFR: AZROCK PRODUCTS DIV., UVALDE ROCK ASPHALT CO.
Circle 227 for further information



FLOOR TILE HAS WAVED PATTERN

MFR'S DESCRIPTION: ceramic floor tile introduced with interesting waved or serpentine pattern.
USES: commercial flooring installations.
SPECS/FEATURES: design stated to result from *Setfast* method of positioning 1" ceramic tiles. Patterns can be created with only two basic units, a right-hand and a left-hand unit. Mfr claims manipulation of these two units can create variety of floor designs.
AIA FILE NO. 23-A
MFR: THE CAMBRIDGE TILE MFG. CO.
Circle 228 for further information

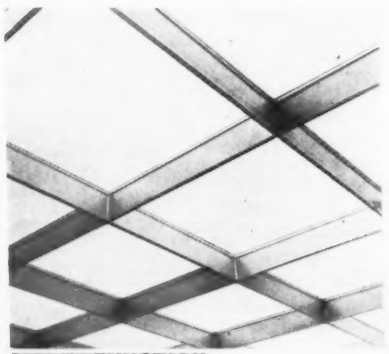


INCOMBUSTIBLE, ACOUSTICAL CEILING UNITS

MFR'S DESCRIPTION: *Classic Minaboard*, lay-in acoustical ceiling units, introduced.
USES: in exposed grid ceilings.
SPECS/FEATURES: made of mineral fiber, product is finished in washable white paint. Rated Class A (Incombustible) under Federal Specifications SS-A-118b; also bears UL label. Removable units are 24" x 48"; have excellent resistance to sound transmission, according to mfr.
AIA FILE NO. 39-B
MFR: ARMSTRONG CORK CO.
Circle 229 for further information

METAL CEILING COVE MOLDING

MFR'S DESCRIPTION: metal step-ceiling cove molding introduced for use with gypsum wallboard construction.
USES: residential construction.
SPECS/FEATURES: mfr claims product achieves effect of stepped cove previously accomplished only by more costly means. Installing cove over wallboard gives two-step effect; installing against studs and then butting wallboard panels against it gives single step. Joints are sealed and faired by joint compound and tape. Any decorative finish can be applied, according to mfr.
AIA FILE NO. 23-J
MFR: NATIONAL GYPSUM CO.
Circle 230 for further information



MULTI-FUNCTION CEILING UNIT

MFR'S DESCRIPTION: *Sigma III* introduced as revised, slimmed-down version of original *Sigma* multi-function ceiling.
USES: various ceiling installations.
SPECS/FEATURES: said to combine comfortable lighting with noise absorption and provide a grid for support of thin-wall movable partitions. Air diffusion is through textured louvers. High levels of illumination are maintained, according to mfr, by utilizing louvering effect of acoustical baffles and by 45° x 45° shielding of the steel framed louvers.
AIA FILE NO. 17-A
MFR: THE WAKEFIELD CO.
Circle 231 for further information

DURABLE VINYL FLOORING MATERIAL

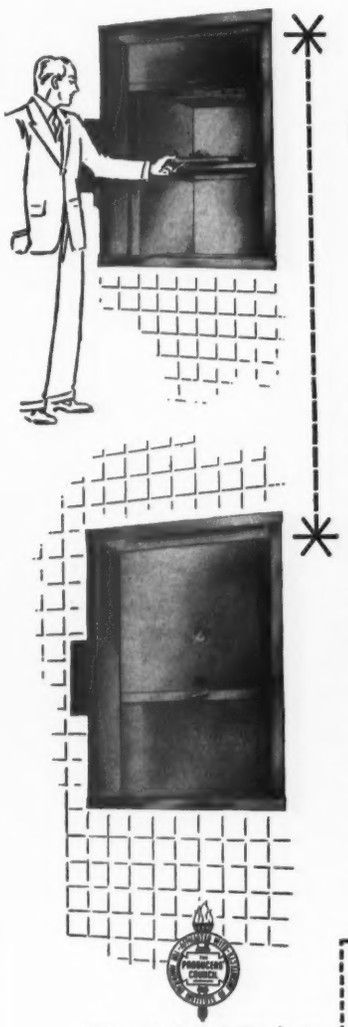
MFR'S DESCRIPTION: durable vinyl carpet developed, to bridge gap between hard and soft floor covering.
USES: interior and exterior applications in motels, restaurants, beach clubs, homes, offices, hospitals, etc.
SPECS/FEATURES: offered in eight colors, material is said to be resistant to weather, mildew, marks and fire. Can be installed on, above or below grade, directly on most types of flooring, according to mfr; only over asphalt tile, lacquered surfaces or linoleums is a lining felt or similar barrier recommended. Also described as impervious to dampness, mold, moths and vermin; can be washed with soap and water.
AIA FILE NO. 28-E
MFR: UNITED STATES RUBBER CO.
Circle 232 for further information

METALS/GLASS

ELECTROSTATIC SHIELDS OF GLASS

MFR'S DESCRIPTION: electrostatic shields of glass developed for laboratory use, offered as shock and corrosion resistant panels in sizes up to 2' x 6'.
USES: as windows and transparent partitions which drain off electromagnetic interference.
SPECS/FEATURES: mfr claims shields have been tested in laboratories, hospitals and on computers, and have successfully eliminated static and provided required visibility. As windows in giant computers, glass panels

Concentrate Responsibility...



Specify SEDGWICK **Dumb Waiters** and SEDGWICK **Dumb Waiter Doors**

When you select a Sedgwick Dumb Waiter, you get a *completely* integrated installation — including dumb waiter doors — designed, engineered, manufactured and installed by Sedgwick.

This places the responsibility for the entire installation in the hands of *one* supplier — cutting in half the red tape, contracts and approvals, and eliminating your coordination of door and dumb waiter design and erection. Furthermore, all equipment is shipped at the same time, saving shipping and handling costs. The same mechanics install both doors and dumb waiters.

Sedgwick Dumb Waiters and Doors are available in a complete range of modern, improved types and standard sizes that can be adapted to fit requirements exactly.
(See standard specifications and layouts in SWEETS 24a/Se

Doors are manufactured in bi-parting, slide-up, slide-down or hinged arrangement. Also access and clean-out doors. (Underwriters' Labelled where required.) *Send today for complete literature and specifications.*

Other Sedgwick Products
★ SIDEWALK ELEVATORS
★ FREIGHT WAITERS
★ RESIDENCE ELEVATORS
★ "STAIR-TRAVELORS"

NATIONWIDE SERVICE

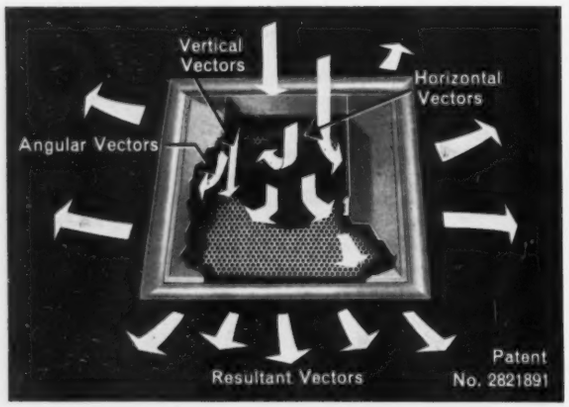
Sedgwick MACHINE WORKS
289 West 14th Street, New York 11, N. Y.
☐ Please send general information
☐ Please send specific recommendation
on: _____
_____
NAME _____
ADDRESS _____
CITY _____ STATE _____
Circle 129 for further information

to hold doors open...

russwin doorware

The Russwin 1750 Holder — The ultimate in door holding efficiency. Extruded brass construction . . . virtually wear-free holding latch. Slide rides on tracks, free of dust, dirt. A smartly-designed, heavy-duty holder. For further information write Russell & Erwin Division, The American Hardware Corporation, New Britain, Connecticut.

Circle 130 for further information



The air goes where you want it ...with the original square perforated face diffuser

Uni-Flo square and rectangular ceiling diffusers with perforated faceplates provide a high rate of aspiration and great flexibility to meet the requirements of modular construction or any arrangement of partitions. The air pattern can be adjusted for vertical or horizontal deflection, and for one-, two-, three-, or four-way discharge. They provide quiet, draftless air distribution with minimum ceiling smudging. Send for Catalog No. F-6597-2.

BARBER COLMAN

BARBER-COLMAN COMPANY
Dept. F, 11124 Rock Street, Rockford, Illinois

Circle 131 for further information

PRODUCTS, EQUIPMENT, MATERIALS

carry off electric charges which build up in equipment. If not eliminated, this interference could interfere with readings and computations. Windows also permit visual check on equipment. Recommended for use in radio and television studios, as well as military, medical and scientific applications. Shield consists of panel of borosilicate glass coated on one side with thin transparent metallic film. Coating intercepts radiated interference which can then be grounded. Coated panel said to transmit 70 per cent of visible light.

AIA FILE NO. 26-A-9

MFR: CORNING GLASS WORKS

Circle 233 for further information

TRANSPARENT MIRROR DEVELOPED

MFR'S DESCRIPTION: transparent mirror developed for applications where there is little difference in light intensity.

USES: hospital observation windows, entrance doors, shower doors, security windows in banks, offices and others.

SPECS / FEATURES: *Parallel - O - Grey Mirropane* consists of special chrome alloy, thin enough to be transparent, applied to twin-ground grey glass by thermal evaporation. Appears as mirror when viewed from one side but is transparent from the other side, depending on the relative strength of the light in the areas it separates. Mfr claims positive effectiveness for unit with four-to-one light differential ratio—satisfactory effectiveness with two-to-one ratio.

AIA FILE NO. 26-C-1

MFR: LIBBEY-OWENS-FORD GLASS CO.

Circle 234 for further information

ADHESIVE COATED ALUMINUM FOIL

MFR'S DESCRIPTION: aluminum foil now available, coated with adhesive which bonds it permanently to plastics, plywood and other wood products.

USES: as component in manufacture of plywood, furniture panels, wall coverings, plastic laminates, veneers, etc.

SPECS/FEATURES: development believed to be first to economically combine advantages of foil with nonmetallic feel and decorative possibilities of other materials. Mfr states when foil is bonded to wood or plastic products, it may serve as moisture barrier, strengthening agent or disperser of heat. Product utilizes *Dri-Line*, adhesive coating of Poly-

BLUE PRINT ROOM
WHERE ARE THOSE PRINTS? I'VE BEEN WAITING A COUPLE OF HOURS NOW!!
ENGINEER
IF I HAVE TO WAIT MUCH LONGER THEY WON'T KNOW ME WHEN I GET BACK TO TH' OFFICE!
DON'T RUSH ME, BUSTER! SEVEN JOBS ARE AHEAD OF YOURS!
AW! FER PETE'S SAKE!

DOES THIS HAPPEN TO YOU?

Rotolite

DISTRIBUTORSHIPS STILL AVAILABLE SOME AREAS ON EXCLUSIVE BASIS. Produce steady repeat business in supplies.

is the quickest most inexpensive way you EVER heard of to make white copies of *anything* translucent. Takes SO little space. Just Hang it on the wall. You'll say "Boy! what a time-saver and cost-saver! I sure need one in My office!"

Write for folder.

PRICES:
18" $129.50. 27" $149.50.
42" $189.50

Slightly higher, Denver and West.
f.o.b. Stirling, N.J.

ROTOLITE SALES CORP. STIRLING, N. J.

Circle 132 for further information

FULL INFORMATION ON THE TWO MOST-SPECIFIED* HARDWOOD FLOORS

permaCushion†
Free-Floating Resilient Floor System

***Ironbound*®**
Continuous Strip® Hard Maple Floor

**called for "by name" more than any other hardwood floors*

yours free!

Write today to Robbins Flooring Co., Reed City, Mich., Dept. AEN-660

†Patented and Trademarked in U. S. and Canada.

ROBBINS FLOORING COMPANY
Reed City and Ishpeming, Michigan
WORLD'S LARGEST MANUFACTURER OF MAPLE FLOORING

Circle 133 for further information

ability

stands out in

New MARLEY Series B DriCooler®
CONDENSERS

capability

Tops in Heat Transfer: Exclusive vertical, forced-draft design moves more pounds of air per cubic foot. Diagonally mounted coils form plenum that diffuses air over all coil surfaces. Entire coil area is functional—no "dead" spots, no recirculation.

adaptability

23 models: One will pin-point any job of 10 to 140 tons nominal capacity. Modular coils permit broad flexibilty for multi-circuit service. Vertical discharge means unrestricted choice of location regardless of wind direction.

durability

Rugged, Rigid Construction: Coils and mechanical equipment are mounted on heavy welded and bolted truss-type steel frame—all hot dip galvanized. Support members are sturdy, broad angles that add materially to long service.

compatability

Appearance Is Plus Factor: New design uses newest materials. Casing of embossed, corrugated aluminum panels, precision-fitted corner rolls and manifold covers achieve effective harmony with modern structural design.

controlability

All-Season Service: DriCoolers equipped with Marley-originated ADB Precoolers level off high dry bulb peaks and pressures by adiabatically reducing incoming air temperature (without spray on coils), permitting economical selection of equipment and added capacity when needed. Equipped with a Damper Control System, DriCoolers maintain uniform pressure during low dry bulb periods; automatically control single or multi-circuit services.

**U. S. and Foreign Patents Pending*

THE MARLEY COMPANY KANSAS CITY, MISSOURI

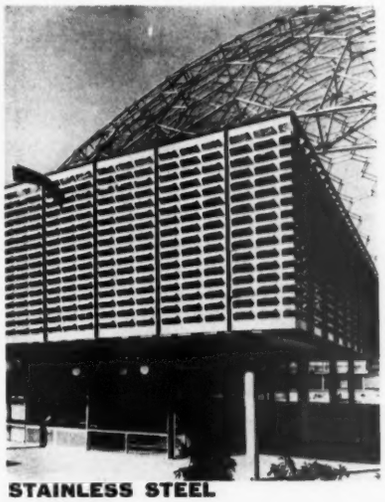
Circle 134 for further information

mer Industries, Inc., to achieve permanent bonding. Reported to meet shear strength and moisture resistance requirements of Commercial Standards and NEMA Standards for cigarette-proof plastic laminates. Available in gauges down to .001, in widths up to 50", coated on one or both sides.

AIA FILE NO. 15-J

MFR: ALUMINUM CO. OF AMERICA

Circle 235 for further information



STAINLESS STEEL IN COLOR

MFR'S DESCRIPTION: *ColorRold*, stainless steel in popular colors announced.

USES: various architectural applications.

SPECS/FEATURES: product stated to combine strength and durability of stainless steel with attractive color. Mfr states material conforms well to such fabricating techniques as shearing, blanking, brake forming, perforating, bending and stamping. Color is incorporated not as protective coating but purely for decorative purposes. Features include resistance to corrosion, weathering and heat; may be repaired by brush or spray apparatus in field. Available in popular gauges and widths. Shown is application on recent American Society of Metals Building near Cleveland, Ohio.

AIA FILE NO. 15-H-1

MFR: WASHINGTON STEEL CORP.

Circle 236 for further information

ANODIZED ALUMINUM CURTAIN WALLS

MFR'S DESCRIPTION: *Amarlite*, polished, buffed and anodized aluminum curtain walls in five separate series, currently available.

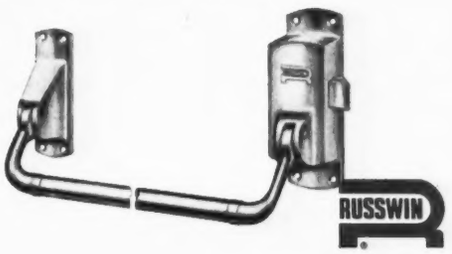
USES: exterior wall applications.

SPECS/FEATURES: units are designed to match line of *Amarlite* store fronts. Series are: *Trimline Wall 808*, sealed wall system for single or

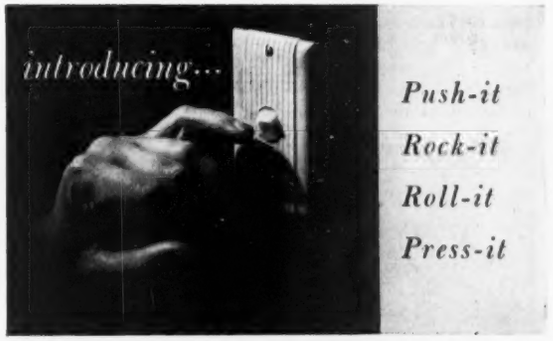
to assure safe exit...

russwin doorware

The Russwin Rim Exit Bolt — Heavy-duty mechanism . . . simple design. Only three moving parts. Built throughout for complete dependability. Smooth, instant, touch-and-go action. Russwin removable mullion permits full, double-door openings. For further information write Russell & Erwin Division, The American Hardware Corporation, New Britain, Connecticut.



Circle 135 for further information



THE ALL-NEW

P&S® ROCKER-GLO SWITCH

. . . the switch that *looks* right, *feels* right and *is* right for every type of wiring job.

Here is the one switch with the most wanted features on the market today.

The merest touch causes instant, silent action . . . and Rocker-Glo glows in the dark.

Available in Despard and narrow rocker types.

Write for brochure, Dept. AE-66

P&S® PASS & SEYMOUR, INC.
SYRACUSE 9, NEW YORK

60 E. 42nd St., New York 17, N.Y. 1440 N. Pulaski Rd., Chicago 51, Ill. In Canada: Renfrew Electric Co., Ltd., Toronto, Ontario

Circle 136 for further information

PRODUCTS, EQUIPMENT, MATERIALS

multi-story construction; *Trimline 707*, standard modular wall system for one or two story erection; *HV Trimline 404*, exterior-glazed system; *HV Trimline 303*, insulated wall construction; and *HV Trimline 202* flush glazing system for grid walls, show windows, etc. Complete systems said to include entrances, windows and other operational elements. All feature concealed fastenings and double-checked waterproofing with emphasis at expansion and stack joints.

AIA FILE NO. 17-A

MFR: AMERICAN ART METALS CO.

Circle 237 for further information

STEEL PANELS IN COLOR

MFR'S DESCRIPTION: color-coated steel now offered in nine colors.

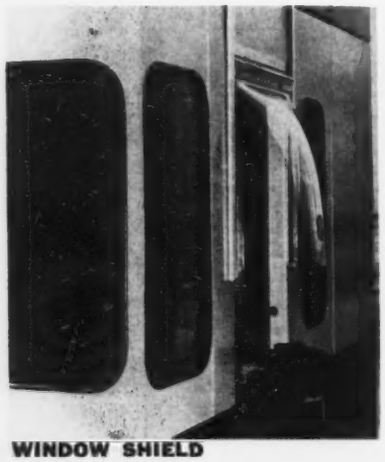
USES: used on walls and roofs or as accent material with brick, wood, stone or glass.

SPECS/FEATURES: described as strong, economical and durable material with attractive appearance. Color available on 26-gage panels, 36" wide, in any length desired. Color is factory-applied and baked-on—won't chip, peel or fade, according to mfr.

AIA FILE NO. 15-H

MFR: STRAN-STEEL CORP., DIV., NATIONAL STEEL CORP.

Circle 238 for further information



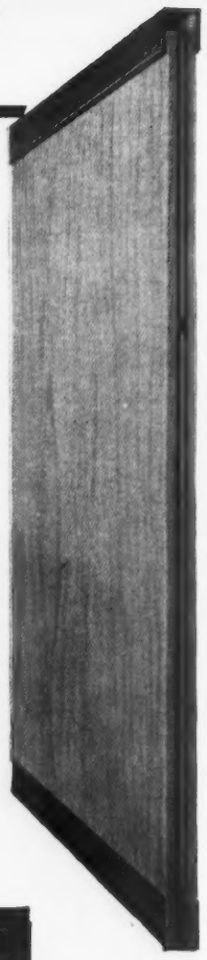
WINDOW SHIELD IS TRANSPARENT

MFR'S DESCRIPTION: shaped shield to provide weather protection for windows available, manufactured of *Plexiglas*, material of Rohm & Haas Co.

USES: as transparent awning in residential and commercial structures, as well as guard house booths.

Air Wall the first and

THE WALL OF VERSATILITY



PORTABLE—VERSATILE...

AIRWALL is a lightweight, completely portable wall that can be utilized anywhere it is desirable to divide valuable floor areas. Weight, approximately 1.8 lbs. per square foot. No floor or ceiling attachments are required. Each panel is simply set in position and the AIRSEAL is inflated providing a rigid wall that will stand indefinitely. Operation is completely pneumatic without messy hydraulic mechanisms.

FLEXIBLE...

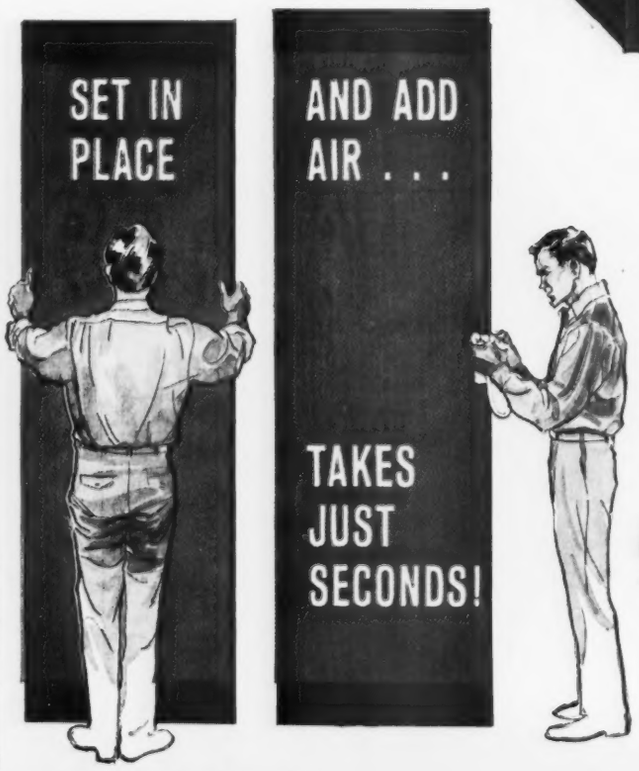
AIRWALL is equally practical for use as semi-permanent walls or walls that are constantly being changed to meet varied space requirements. Individual panels are 36" wide, heights to 12'... the tongue and groove joints have been designed so that the walls may be installed in a straight line or in a curved arrangement. "AIRWALL" may be supplied with door panels, 42" wide; pass-through panels; window panels and interchangeable filler panels.

ECONOMICAL...

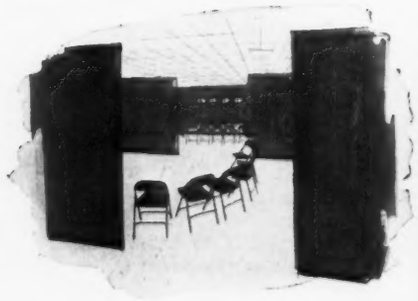
AIRWALL is economical to purchase and requires no installation or erection costs. AIRWALL is classified as furniture and fixtures and for tax purposes does not become an integral part of the building, therefore it is not depreciated over lease term or building life. If you move, take it with you. AIRWALL will reduce remodeling and redecoration costs through the elimination of permanent, non-bearing walls.

SOUND REDUCING...

AIRWALL provides a tight seal at the floor and ceiling level to offer a sound control never before possible with a portable wall. This special seal, patent pending, combined with AIRWALL's unique construction provides a portable wall that offers approximately the same sound retarding qualities as a permanent wall with 2 x 4 studs, lath and plaster. When functions of a "noisy" nature are to take place in adjoining areas a double AIRWALL with a 6" air space between walls will assure the elimination of sound interference between areas.



APPLICATIONS ARE UNLIMITED



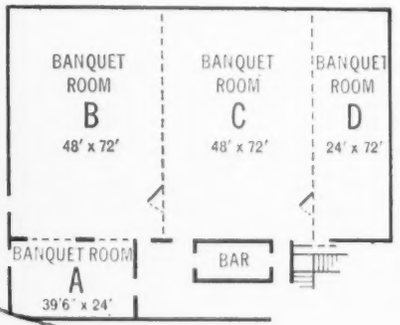
IDEAL FOR HOTELS... OFFICES...

WIDE VARIETY OF FACING FINISHES AVAILABLE...

AIRWALL panels may be finished with your choice of material to create dramatic interiors that are fresh and original. Select from modern vinyls, wear-resisting plastics and beautiful hardwood veneers with a fine furniture finish. For interesting decorating variations panels may be finished with one material on one side and a different pattern of the same material on the other... permits an instantaneous change of decor.

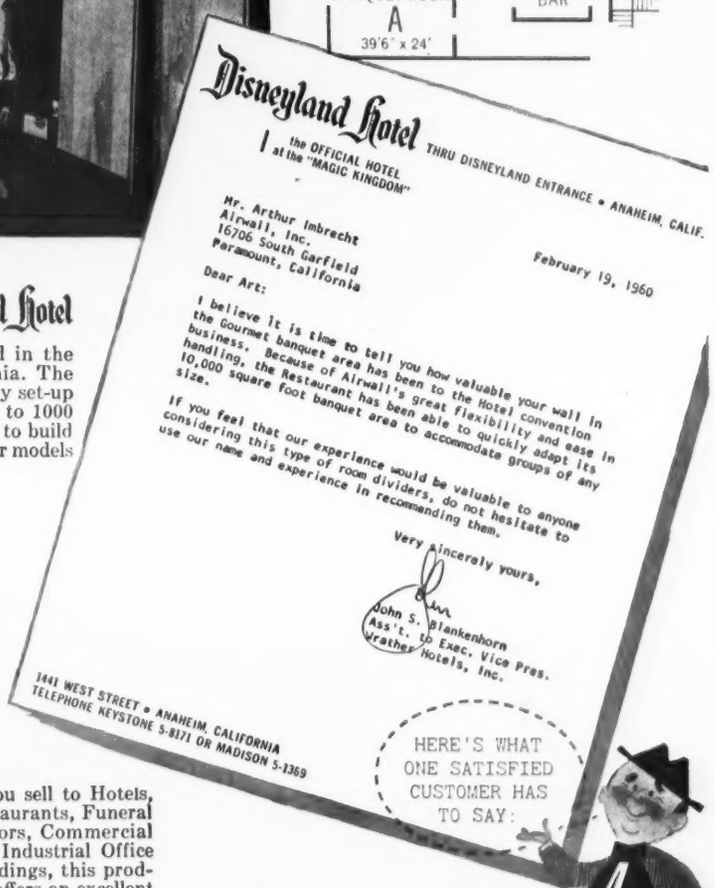
Circle 137 for further information

d' only truly portable wall!



AirWall at the Disneyland Hotel

This photo shows one of the AIRWALL s used in the beautiful Disneyland Hotel, Anaheim, California. The AIRWALL s permit this hotel to quickly and easily set-up various sized rooms to accommodate groups of 25 to 1000 people. In one instance the AIRWALL s were used to build a room within a room to provide dressing facilities for models during a style show.



Disneyland Hotel
the OFFICIAL HOTEL at the "MAGIC KINGDOM"
THRU DISNEYLAND ENTRANCE • ANAHEIM, CALIF.

Mr. Arthur Imbrecht
Airwall, Inc.
16706 South Garfield
Paramount, California

February 19, 1960

Dear Art:

I believe it is time to tell you how valuable your wall in the Gourmet banquet area has been to the Hotel convention business. Because of Airwall's great flexibility and ease in handling, the Restaurant has been able to quickly adapt its 10,000 square foot banquet area to accommodate groups of any size.

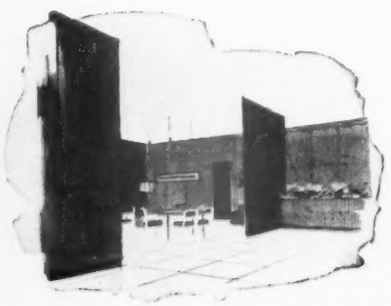
If you feel that our experience would be valuable to anyone considering this type of room dividers, do not hesitate to use our name and experience in recommending them.

Very sincerely yours,

John S. Blankenhorn
Ass't. to Exec. Vice Pres.
Prather Hotels, Inc.

1441 WEST STREET • ANAHEIM, CALIFORNIA
TELEPHONE KEYSTONE 5-8171 OR MADISON 5-1369

HERE'S WHAT ONE SATISFIED CUSTOMER HAS TO SAY:



AND RESTAURANTS

If you sell to Hotels, Restaurants, Funeral Parlors, Commercial and Industrial Office Buildings, this product offers an excellent sales opportunity . . . there are still many outstanding sales territories available. Write today.

A-W Representatives are located in all principal cities. Write today for complete information and the name of your local AIRWALL Sales-Engineer.

AIRWALL offers architects, building owners, managers and anyone else involved in the problem of dividing space and sound an entirely new flexibility of design. For here is a wall that can be shifted at will—in a matter of minutes—without tools or special craftsmen. Offers new horizons in design possibilities for the construction of all types of buildings. Truly, the applications for AIRWALL are limited only by your most wild imagination.

AirWall Inc.
16702 S. GARFIELD AVENUE, PARAMOUNT, CALIFORNIA
A SUBSIDIARY OF
RICHARDS-WILCOX MFG. CO.
AURORA, ILLINOIS

Circle 137 for further information

PRODUCTS, EQUIPMENT, MATERIALS

SPECS/FEATURES: reported to be transparent, durable, shatterproof unit for protection against rain, snow and sleet. Said to permit control of drafts and rain without necessity of adjusting louvers and shades. Advantages stated to be similar to those provided through use of domed skylights.
AIA FILE NO. 35-P-2
MFR: INDUSTRIAL METAL FABRICATING CO.
Circle 239 for further information

SKYLIGHT UNIT FEATURES COLOR

MFR'S DESCRIPTION: *Consolite Double Dome* fibrous glass-reinforced skylights, with decorative colors.
USES: decorative applications in residential kitchens, living rooms, etc., as well as commercial applications.
SPECS/FEATURES: featured is inner dome flat sheet of colorless embossed fibrous glass, integrally bonded to outer rounded dome. Purpose is to present more finished appearance to interior skylight ceiling well and eliminate rounded look when viewed from below. Said to be equally suitable for flat or pitched roofs. Available in yellow, blue, pink, green and white. Self-flashing or curb mounting models, standard and fire retardant, offered in range of sizes.
AIA FILE NO. 12-J
MFR: CONSOLIDATED GENERAL PRODUCTS, INC.
Circle 240 for further information

DUMBWAITER FOR SCHOOL INSTALLATION

MFR'S DESCRIPTION: electrically-powered dumbwaiter offered.
USES: multi-story school buildings.
SPECS/FEATURES: designed specifically for schools, car can be provided with any arrangement of shelves for lifting books to libraries and other locations. Shelves may be relocated or removed to permit carrying cafeteria or janitor equipment to another floor. Unit is electrically-powered and controlled.
AIA FILE NO. 33-D
MFR: D. A. MATOT, INC.
Circle 241 for further information

ELECTRONIC SYSTEM FOR LANGUAGE STUDY

MFR'S DESCRIPTION: *Electronic Learning Center* offered as integrated, electronic system for foreign language instruction.
USES: school installations for instruction in foreign languages, speech therapy, remedial reading and voice training.

PROVED...

The most practical most economical way to insulate block & cavity walls

ZONOLITE® WATER-REPELLENT MASONRY FILL INSULATION

Century Electric Plant—McMinnville, Tenn. JOHN CHARLES WHEELER—ARCHITECT

Flows freely into cores or cavities ...no cutting, fitting or furring... no waste.

Fills 100%...won't settle, permanently effective. STOPS passage of moisture from outer to inner wall surface.

Use of new kind of insulation effects substantial economies in erection of $660,000 electric plant!

Walls in this plant are concrete blocks in production areas, concrete blocks and brick cavity in the office section. All masonry walls, totalling 23,250 sq. ft. in area, were insulated with Zonolite Masonry Fill Insulation for under 10¢ a square foot. Total labor cost only $110.00!

For this low cost, heat loss through walls was so reduced that only 10 heating units (1,000,000 BTU each) were installed, whereas 12 would have been needed without insulation. *Here was a direct saving of $4,900.00 with continuing substantial savings on fuel assured throughout the life of the building.*

Zonolite Masonry Fill so improved the insulating value of masonry walls that the interior side is left exposed and painted, thereby eliminating costly finish materials.

Comparable savings can be realized with Zonolite in any concrete block or brick cavity wall.

ZONOLITE COMPANY Dept. AEN-60
135 South La Salle Street • Chicago 3, Illinois

WHY NOT GET ALL THE FACTS?

PHONE YOUR ZONOLITE SALES ENGINEER

Information and technical assistance are as close as your telephone. Call your Zonolite Representative now...or write

ZONOLITE COMPANY
135 South La Salle St., Dept. AEN-60, Chicago 3, Illinois

Circle 138 for further information

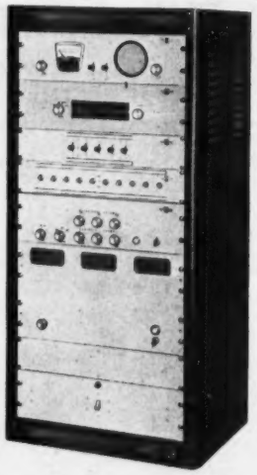
PRODUCTS, EQUIPMENT, MATERIALS

SPECS/FEATURES: system permits teacher, with switchboard arrangement controlling 16 tape channels, to give individual instruction to each class member, using tape recorded lessons transmitted through earphones. Students, in soundproofed cubicles, have microphones for responses which may be recorded and played back for purposes of evaluation. Teacher, through use of monitoring control, can check student work or provide special tutoring in two-way conversation. Among features of system: teacher's console desk of steel construction; transistorized amplifiers for easier servicing and reduction in equipment size; construction of student stations in connected units of two and four for varied classroom arrangements; and swivel chairs for purpose of student comfort.

AIA FILE NO. 31-i-7

MFR: AMERICAN SEATING CO.

Circle 242 for further information



CUSTOM SOUND COMPONENTS LINE

MFR'S DESCRIPTION: line of compatible custom sound components introduced.

USES: industrial, commercial and institutional sound applications.

SPECS/FEATURES: components developed to furnish everything from low level sound reinforcement—music distribution with high fidelity characteristics—to high power paging equipment. Line reportedly can be built up from simple paging system to complete combination of music distribution and area or general paging, with multiple microphone inputs, automatic muting of music while paging, emergency priority on microphone channels, all installed in com-

pact rack. Components consist mainly of: AC power panel; relay panel; input panel; AM-FM tuner; monitor panel; output panel (10 switches, 20 outlets); four-speed phono changer and tape player; pre-amp panel; amplifiers; speakers; microphones; and rack.

AIA FILE NO. 31-i-7

MFR: WEBSTER ELECTRIC CO.

Circle 243 for further information

ELECTRIC TYPEWRITER ERASING UNIT

MFR'S DESCRIPTION: availability of *Presto #80*, electric typewriter eraser, announced.

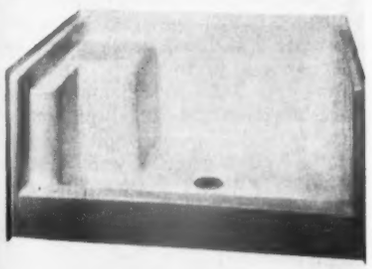
USES: office applications.

SPECS/FEATURES: unit employs a flexible shaft mounted with pencil slim erasing unit. Said to permit erasure of smallest character without aid of typing shield. Result achieved through high speed rotation of ⅛" diameter, self-pointing eraser, without exertion of pressure. Mfr states unit eliminates smudging of carbon copies and time consuming use of slip sheets. Erasers supplied in three grades for use on tracings or drawings in pencil, ink or ball point pen, as well as masters, negatives or plates for various types of reproduction equipment.

AIA FILE NO. 35-H-4

MFR: METAL SPECIALTIES MFG. CO.

Circle 244 for further information



POLYESTER RESIN SHOWER RECEPTORS

MFR'S DESCRIPTION: announcement made of coated, glass fiber reinforced, polyester resin, shower receptors.

USES: residential shower and bath applications.

SPECS/FEATURES: units reported to be lightweight, seamless, one-piece construction, virtually unbreakable and resistant to chipping, leaking, rotting and rusting. Luxury receptor with seat is shown; other models available, in shades of white, gray, green, tan, pink and yellow.

AIA FILE NO. 29-H-3

MFR: FIBERSHEEN FIXTURES DIV., DENVER METALS & CHEMICALS CORP.

Circle 245 for further information

STEEL FLUSH DOOR LINE

MFR'S DESCRIPTION: modern styling, rugged construction and economy price reported as features of *Sturdi-Door* line.

USES: schools, institutions and commercial buildings.

SPECS/FEATURES: twelve flush door types offered, including louvered, vision light and half glass, as well as combinations of these in standard heights and widths. Units are welded construction, fabricated from 18 gauge steel panels and 16 gauge stiles. Available with UL "B" labels (1½ hr) or "C" labels (¾ hr) in all widths except 2' 0".

AIA FILE NO. 16-B

MFR: AMWELD BUILDING PRODUCTS, DIV., THE AMERICAN WELDING & MFG. CO.

Circle 246 for further information

DESIGNS ADDED TO WALL COVERING LINE

MFR'S DESCRIPTION: *Handprints* design collection added to *Vicrtex VEF* vinyl wall coverings and upholstery fabrics.

USES: room decorations in homes, offices, hotels and institutions.

SPECS/FEATURES: designs said to add distinctive "fourth dimension" to vinyl materials. Number of patterns stated to be almost unlimited, since arrangements can be made to individual desires.

AIA FILE NO. 28-C

MFR: L. E. CARPENTER & CO., INC

Circle 247 for further information

PLASTIC WALLCOVERING LINE EXPANDED

MFR'S DESCRIPTION: two plastic material designs added to upholstery and wallcovering line.

USES: commercial and residential uses.

SPECS/FEATURE: *Jigsaw* is embossed fabric designed for commercial utilization; *Deauville* is intended as wall covering material. Both are of durable, stain resistant vinyl with 27 ounce finish, according to mfr. Available in fifteen color shades.

AIA FILE NO. 28-C

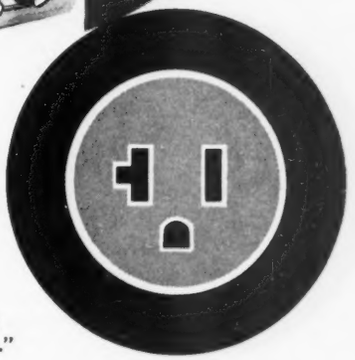
MFR: FEDERAL INDUSTRIES DIV., TEXTRON, INC.

Circle 248 for further information

NEW CIRCLE F 20-AMP "U"-GROUND DEVICES

. . . Section 220-3 (b) of the 1959 National Electrical Code states . . .

"For the small appliance load in kitchen, laundry, pantry, dining room and breakfast room of dwelling occupancies, (1) 2 or more 20-ampere branch circuits in addition to the branch circuits specified in paragraph 220-3 (a) shall be provided for all receptacle outlets (other than outlets for clocks) in these rooms, and such circuits shall have no other outlets."



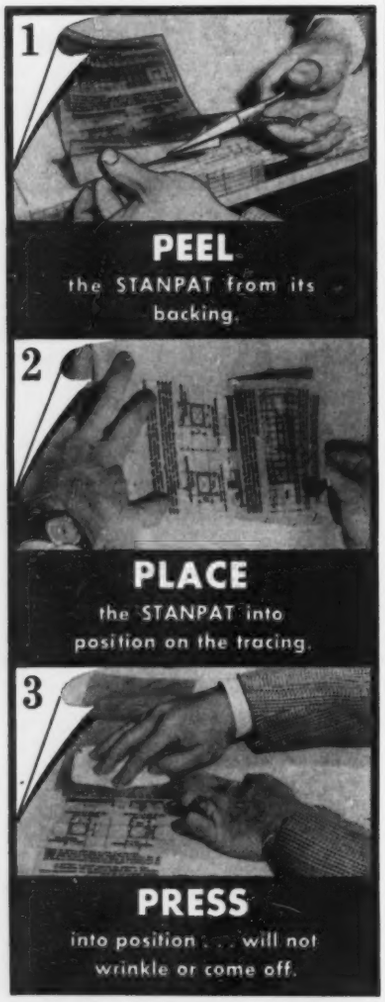
Designed to provide full compliance with the revised Code, Circle F's *new* No. 2532 does much more! It becomes a "universal" outlet! It accommodates appliances, heavy-duty portable tools, business machines, etc., having substantial energy requirements, where the new 20 A.-125 V. plug cap (No. 2528) is necessary. It also accommodates 15 A.-125 V. 3 wire U-ground and standard parallel blade caps. One outlet for all! Circle F's quality is tops and the price is right. Contact your Circle F representative for complete details.

CIRCLE F MFG. CO.

TRENTON 4, NEW JERSEY

Circle 139 for further information

THIS IS THE CORRECT EASY WAY



Don't chain your engineers to time-consuming routine on repetitive blueprint items . . . free them for more creative work and save countless hours of expensive drafting time with STANPAT.

STANPAT prints these items on tri-acetate sheets that are easily transferred to your tracings. No special equipment required . . . reproductions come out sharp and clear . . . and STANPAT is incredibly inexpensive.

19 YEARS OF SERVICE TO INDUSTRY

STANPAT COMPANY
Whitestone 57, N. Y., U. S. A.
Phone: FLushing 9-1693-1611

☐ Please quote on enclosed samples.
☐ Kindly send me STANPAT literature and samples. Dept. 185

Name_____
Title_____
Company_____
Address_____

Circle 140 for further information

LITERATURE

Literature cited in this department is available from various manufacturers and associations free of charge, except where indicated. To obtain copies, circle the keyed numbers on the reader service cards facing pages 1 and 64.

RESILIENT FLOORS

Facts and Data on Resilient Floors is revised booklet covering important factors in selecting correct resilient floor and wall coverings. Technical data included on: product and installation specifications, preparation of underfloors, tables of properties and maintenance data and pattern illustrations of line of floor and wall coverings. (46 pp.)

AIA FILE NO. 28-E

MFR: CONGOLEUM-NAIRN, INC.

Circle 300 for further information

300

RESIDENTIAL ELEVATORS

Advantages of *HomeLIFT* residential elevators are put forth in current booklet. Among data is information on physical effort involved in climbing stairs, conveniences of units, installation suggestions and operating costs. *EscaLIFT*, stair-climbing chair, also described. (8 pp.)

AIA FILE NO. 33-B

MFR: SHEPARD ELEVATOR CO.

Circle 301 for further information

CURTAIN WALL REFACING

Timely booklet discusses problem of whether it is economically sound and architecturally desirable to raze and rebuild or to remodel and reface old commercial buildings which are structurally sound. Curtain wall refacing is described and components are pictured. Photographs show significant applications of components. (8 pp.)

AIA FILE NO. 17-A

MFR: PITTSBURGH PLATE GLASS CO.

Circle 302 for further information

LIGHTING

FIXTURES CATALOG

Visions of Beauty—Fashions in Light is current lighting fixture catalog which describes both interior and exterior residential fixtures. Publication features photographs and illustrations in full color, depicting, among others: ceiling pulldown models in modern, contemporary, traditional and colonial stylings; pendants in clusters of three and seven; traditional and modern chandeliers and matching wall bracket fixtures for halls and entryways; glass units for close-to-ceiling mounting fluorescent fixtures in strip, circular and multiple mountings; recessed fixtures and lawn lantern posts. Fixtures' design said to be guided by principles of impression, comfort, convenience, safety and protection. (66 pp.)

AIA FILE NO. 31-F-2

MFR: MOE LIGHT DIV., THOMAS INDUSTRIES, INC.

Circle 303 for further information

303

INTERIOR FIXTURES

Comprehensive catalog contains descriptive matter for extensive *Design Gallery* line of lighting fixtures. Specific information, including reference material, photographs, drawings and specifications, is presented for decorative fixtures of pendant, chandelier and wall mounted types. Component materials and craftmanship—e.g., woods, metals and *Rotaflex*, a strong, lightweight plastic material, are discussed. Price list and standard specifications are included. (64 pp.)

AIA FILE NO. 31-F-23

MFR: THE HEIFETZ CO.

Circle 304 for further information

PLASTIC LIGHTING UNITS

Plastics lighting catalog compiled for architects, engineers and lighting specialists. Material is contained in durable binder for reference ease. Information includes descriptions of *K-Lite* plastic prismatic lens panels, photometric data on prismatic lens series, various types of special prismatic extruded panels and shapes, open extruded shapes and plastic properties chart. Future indexed sheets will be offered when available. (10 pp.)

AIA FILE NO. 31-F

MFR: K-S-H PLASTICS, INC.

Circle 305 for further information

305

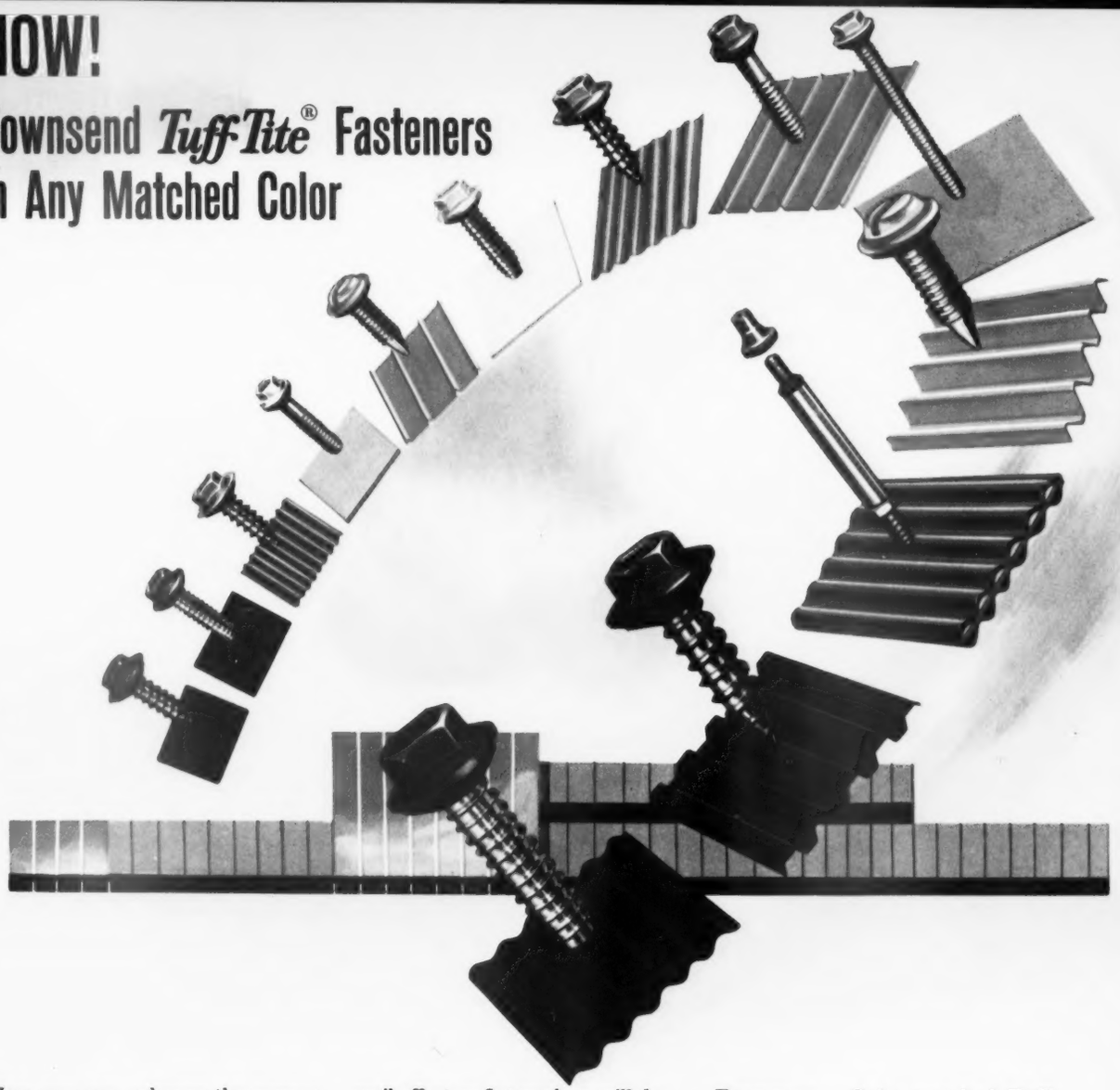
ALUMINUM FLOODLIGHTING

Catalog *LP-A* describes and illustrates line of weatherproof, die-cast aluminum outdoor bullet holders, designed for all exteriors requiring a

Circle 141 for further information about TOWNSEND →

NOW!

Townsend *Tuff-Tite*® Fasteners In Any Matched Color



Now you can enhance the appearance of your buildings with fasteners that match exactly the color of the siding—and you can do it economically. After three years of research Townsend has perfected a color coated head for Tuff Tites which is permanent and attractive as well.

Perfect Match with any color panel or sheet is achieved by spectrophotometric process which eliminates human judgement in matching head to color of material. Basic Tuff Tite design traps neoprene washer under head—it will not squeeze out and spoil effect as flat washers will do.

Adhesion—Resistance to abrasion from setting the fastener is provided by a tough modified-acrylic process coating which is far superior to common paint. This patented coating was developed in cooperation with a leading producer of industrial color coatings.

Maximum Life and weather resistance can be obtained by specifying type 305 stainless steel Townsend Tuff Tite screws, bolts, and curtain wall studs with color-matched heads.

Economy — Color-matched Tuff Tites eliminate cost of installing unsightly caps or expensive daubing of paint on uncoated fasteners.

Service—Townsend stocks millions of uncoated Tuff Tites which can be quickly coated in any color to match your material. Send a small piece of material with your inquiry or order. We will do the rest.

Specify Townsend Tuff Tite fasteners with color-matched heads coated with modified acrylic coating to get the best appearance on your finished job.

Townsend Company

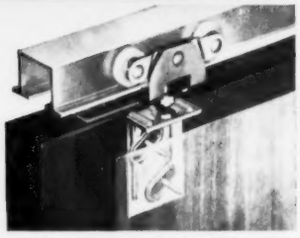
ESTABLISHED 1916

Engineered Fasteners Division

ELLWOOD CITY · PENNSYLVANIA

In Canada: Parmenter & Bulloch Manufacturing Company, Limited, Gananoque, Ontario

Seven out of ten charwomen concur: For superior response to "kneeing," it's Grant 7000 Sliding Door Hardware. Write for your copy of the Grant catalog.



GRANT SLIDING DOOR HARDWARE

GRANT PULLEY & HARDWARE CORPORATION

Eastern Division/ 133 High Street, West Nyack, N. Y.
Western Division/ 944 Long Beach Ave., Los Angeles 21, Calif.

sliding door hardware • drawer slides • drapery hardware • pocket frames • pulls • special sliding hardware • closet rods

Circle 142 for further information

high degree of color fidelity. Single, cluster and pendant fixtures are shown in three styles for ceiling, wall or custom mounting in residences, hotels, schools, public buildings, stores and other exposed locations. (6 pp.)
AIA FILE NO. 31-F-22
MFR: STONCO ELECTRIC PRODUCTS CO.
Circle 306 for further information

TILES/BONDING

TILE BROCHURE

Reflecta, three-dimensional, ceramic glazed tile is featured in recent brochure. Tile face is divided into four equal triangles by indentation; light playing on these surfaces said to create unique and changing patterns. Available in variety of colors, in bright and satin glaze finish. Brochure contains reproduction of material's installation. (4 pp.)
AIA FILE NO. 23-A
MFR: HERMOSA TILE DIV., GLADDING, MCBEAN & CO.
Circle 307 for further information

BONDING CHARTS

Two bonding charts recently issued to provide information and specifications on proper types of adhesives to be used in applications involving ceramic tile work and insulation projects. Cross-indexed charts show specific adhesive product recommended for bonding any combination of materials in all categories covered. Specifications also given for various sizes and shapes of spindel anchors, pronged anchors and washers. Surfaces for tile application include gypsum wallboard, unpainted gypsum white coat, painted plaster, portland cement plaster, poured concrete, terrazzo and others.
AIA FILE NO. 21-F
MFR: MIRACLE ADHESIVES CORP.
Circle 308 for further information

TILE COLORS

Color comparison guides offered, listing asphalt and vinyl asbestos tile lines available from the major floor covering mfrs during 1960. Similar colors featured by companies are interpreted as being commercial equivalents, rather than identical matches, comparable in background color and mottle. Charts are designed for insertion in binder or notebook for permanent reference. (2 pp.)
AIA FILE NO. 23-G
MFR: MASTIC TILE DIV., THE RUBEROID CO.
Circle 309 for further information

TILE SPECIFICATIONS

Federal Specifications dealing with cork tile now available. Topics include: classification; applicable specifications and standards; requirements; sampling, inspection and test procedures; and preparation for delivery. Designated LLL-T-431b, document supersedes Federal Specifications LLL-T-431 and LLL-T-431a. Available by contacting directly either Dodge Cork Co., Inc., Laurel and Manor St., Lancaster, Pa., or Armstrong Cork Co., Liberty St., Lancaster, Pa. (8 pp.)
AIA FILE NO. 40-B-6
MFRS: DODGE CORK CO., INC.; ARMSTRONG CORK CO.
Write mfr directly

HVAC

COIL CATALOG

Catalog specifically designated for rapid, accurate selection of water cooling coils announced. Direct selection method for all types of water cooling coils introduced, and complete compilation of data for easy reference included. Types of water cooling coils are described and explained in detail through use of circuiting illustrations and application recommendations. General coil considerations are explained and accompanied with psychrometric charts.
AIA FILE NO. 34-K-3
MFR: MCQUAY, INC.
Circle 310 for further information

HEAT SURFACE AID

Method for determining sq ft of heating surface required to heat water to a given temperature in a given time announced, described as simple, foolproof and accurate. Data sheet offered as engineering aid, presenting necessary factors, including: (1) gallons to be heated; (2) to what operating temperature; (3) in what minimum time; (4) "U" heat transfer value; and (5) operating steam pressure. (1 p.)
AIA FILE NO. 30
MFR: DEAN PRODUCTS, INC.
Circle 311 for further information

HEAVY DUTY COILS

Line of heavy duty coils for steam, steam distribution and hot water, is described in illustrated bulletin. Units are capably described with emphasis placed upon special features. Layout drawings are included, accompanied by tabulated data on dimensions and weights for *Type H, Type HA, Type HD1* and *Type HW* coils. Bulletin also presents rating curves and related tabular data for wide range of coil selection. Among other information: condensate rating information for both saturated and superheated steam; typical material specification for coil applications involving temperatures and pressures which exceed standard coil construction

HERE'S PROOF
GUTH BRASCOLITES ARE REALLY RUGGED!
This unretouched photo shows how we demonstrate the rugged strength of Guth's Tetragonal design, Alzak Aluminum Reflector. Fred Guth (Mr. Chief Tester, himself) stands right on it. We know this rugged Guth reflector will hold at least 300 pounds!
This is typical of the quality and ruggedness you find in Guth Brascolite Incandescents. They're built for rugged duty PLUS optimum and long life lighting performance!
LIGHTING since 1902
brascolite
The Tetragonal Reflector is used in our Square Recessed Brascolites
THE EDWIN F. GUTH COMPANY
2615 WASHINGTON BLVD
BOX 7079, ST LOUIS 77, MO
Circle 143 for further information

LITERATURE

limits; and installation recommendations, with piping diagrams typical of the various systems in which units are used. (44 pp.)
AIA FILE NO. 30-C
MFR: AMERICAN-STANDARD INDUSTRIAL DIV.
Circle 312 for further information

ENVIRONMENTAL CONTROL

Requirements for an Ultra Clean Facility is current brochure which discusses construction and environmental control systems. Discussion also covers modular wall panels, nondusting materials, illumination, floor covers, air-showers, pass through chambers, pressurized cabinets, temperature-humidity, air pressure, air replacement and filtration. Additional engineering information is available. (8 pp.)
AIA FILE NO. 30
MFR: SHIELDING, INC.
Circle 313 for further information

GAS HEATERS

Literature currently available on expanded line of sealed *Safti-Vent* gas heaters and *Desert Sun* vented recessed gas heaters and gas vented circulators. Units available in cabinet models, recessed wall models and window installed types. All models have burner sealed away from room air.
AIA FILE NO. 30-B-5
MFR: H. C. LITTLE BURNER CO., INC.
Circle 314 for further information

AC STARTER BULLETIN

Bulletin on starters for central air-conditioning applications offered. Detailed information presented on full voltage, reduced-voltage, autotransformer and wye-delta starters in ratings ranging from 208 to 4,900 volts. Electrical characteristics also provided. (8 pp.)
AIA FILE NO. 30-D
MFR: EC&M DIV., SQUARE D CO.
Circle 315 for further information

FLEXIBLE DUCTING

Recent manual explains uses and advantages of *Thermaflex* flexible ducting for air distribution in air-conditioning applications. Improved air flow characteristics and up to 30 per cent savings in installation costs are claimed for material. Product is lightweight, flexible duct, designed for both high and low pressure air-conditioning systems. Is constructed of 3-ply laminate material supported by galvanized spring steel wire helix; is UL approved. (4 pp.)
AIA FILE NO. 30-D-4
MFR: FLEXIBLE TUBING CORP.
Circle 316 for further information

400 Series DOOR CLOSERS
SEMI-CONCEALED AND SURFACE

500 Series DOOR CLOSERS
CONCEALED AND SURFACE

. . . HERE'S UNMATCHED QUALITY, FINEST DESIGN AND THE ULTIMATE PERFORMANCE IN MODERN DOOR CLOSERS.

Circle 144 for further information

CORBIN

Quality is unmistakably stamped on these modern CORBIN Door Closers. They reflect it in appearance and performance. On large doors or small—interior and exterior—CORBIN Closers combine dependable operation and the luxury look. This is the measure of quality, made by CORBIN.

400 SERIES

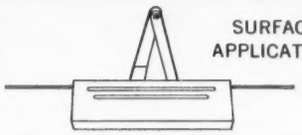
SEMI-CONCEALED APPLICATION

SURFACE APPLICATION

For doors in schools, hospitals, office and commercial buildings—inside and out. Completely adjustable through 180°. One standard mortise or location. Easy to install. Beautifully designed. Available in a variety of modern finishes.

500 SERIES

CONCEALED APPLICATION



SURFACE APPLICATION

Concealed type is completely unobtrusive—the carefully engineered "HID-N-RAIL" mechanism is positioned in the door itself. Both Concealed and Surface types are for interior and exterior doors, either metal or wood. Single location. 180° opening provided—completely adjustable for any desired door control. Available in a variety of modern finishes.

For the finest in hardware, make it CORBIN throughout

CORBIN

P. & F. CORBIN DIVISION
THE AMERICAN HARDWARE CORPORATION
NEW BRITAIN CONNECTICUT

Circle 144 for further information

LITERATURE

COOLER CATALOG

Catalog offered treating series of vertical and horizontal product coolers with centrifugal blowers. Information is provided on *AH* line, redesigned horizontal units, featuring modular construction and allowing for greater flexibility in location of blower discharges, motor and coil locations. Line is available for either high temperature (above 34°) or below freezing applications, with either gas or water defrost available.

AIA FILE NO. 30-F-6

MFR: RECOLD CORP.

Circle 317 for further information

BASEBOARD HEATERS

Current literature announces addition of four improved models to electric hot-water baseboard heater line. Units feature water system permanently weld-sealed against leakage, and heat limit control positively connected to water chamber containing heating element, to provide control against overheating. Publication explains principles of operation, safety features, specifications, installation details and cost reduction. (4 pp.)

AIA FILE NO. 30-C-44

MFR: INTERNATIONAL OIL BURNER CO.

Circle 318 for further information

HEATING MANUAL

Hydronics Heating Manual, in plastic covered, loose leaf binder, offered to architects and engineers. Divided into three sections—residential, commercial and technical—manual covers basic hydronics principles, boiler sizing, modern system design, boiler replacement piping, boiler installation and operation data, controls, specifications and diagrams, pump data, performance charts and graphs. (150 pp.)

AIA FILE NO. 30-C

MFR: PERMAGLAS DIV., A. O. SMITH CORP.

Circle 319 for further information

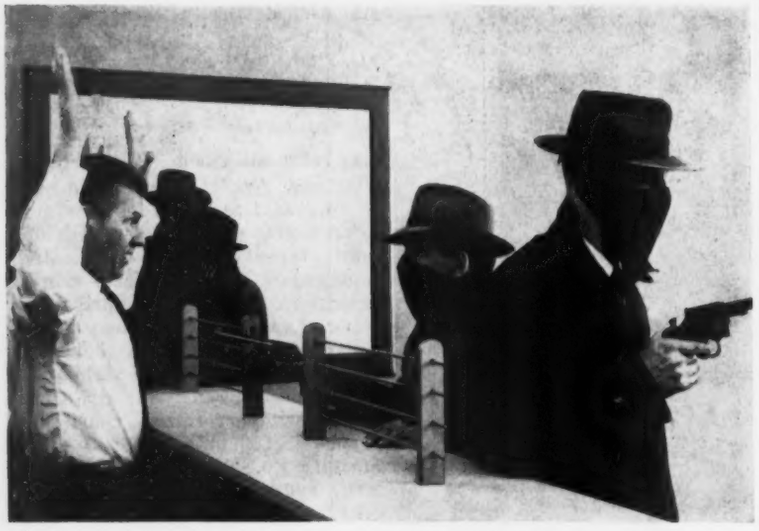
ELECTRICAL/WIRING

TIME SWITCH BULLETIN

Current bulletin features time switches for control of heating, lighting, ventilating and air-conditioning in commercial, office, public, industrial and institutional buildings. Detailed drawings show wiring plans for general applications and for specific heating control applications. Heating section illustrates both low voltage and line voltage systems, and switching from high to low thermostat for night set-back. Dimension drawings of enclosures and mounting brackets presented.

HOW TO WATCH WITHOUT BEING SEEN

From the semi-darkened room, it's a window...



From the banking area, it's a mirror!

Mirropane®, the "see-thru" mirror, has many uses . . . in banks, hospitals, schools, stores, homes . . . anywhere you want to observe—in person or with a camera—without being seen. *Mirropane* can be obtained to provide "see-thru" vision with light differentials as low as 3 to 1 between rooms. For information, call your L·O·F Distributor or Dealer (listed under "Glass" in the Yellow Pages) or write Dept. LM-7860, Libbey·Owens·Ford Glass Co., 811 Madison Ave., Toledo 3, Ohio.

MIRROPANE
the "see-thru" mirror

L·O·F GLASS

LIBBEY·OWENS·FORD GLASS CO.
811 Madison Avenue, Toledo 1, Ohio

Circle 145 for further information

Switches described feature dials revolving once in a week (4 pp.)
AIA FILE NO. 31-i-24
MFR: TORK TIME CONTROLS, INC.
Circle 320 for further information

MULTIPLICATION FACTORS

Conversion Factors is pocket sized compilation of multiplication factors involved in converting fundamental electrical and magnetic units. Over 800 conversion factors included to provide engineers with information which is normally scattered throughout technical literature. (21 pp.)
AIA FILE NO. 31
MFR: AUTOMATIC ELECTRICAL, SUBS. GENERAL TELEPHONE & ELECTRONICS
Circle 321 for further information

LOADCENTER CATALOG

Revised loadcenter catalog currently available. Additions include 400A loadcenter, loadcenters with isolated water heater circuit, single phase units with 3-phase air-conditioning circuit and 200A units with 30A, 60A and 100A branch circuits. Also contained are fuse groups and safety switches. (36 pp.)
AIA FILE NO. 31-D
MFR: WALKER DIV., I-T-E CIRCUIT BREAKER CO.
Circle 322 for further information

TRANSFORMER BULLETIN

Distribution transformers for floodlighting installations are treated in recent bulletin. Data is presented on pole-type transformers with *Permalex* insulation, reported to give 20 per cent added loadability with the same life as former transformers. Publication includes detailed information on product features, applications, photographs, load applications and rating tables. (2 pp.)
AIA FILE NO. 31-B-3
MFR: GENERAL ELECTRIC CO.
Circle 323 for further information

ELECTRICAL WIRING

Suggestions for planning electrical wiring systems are contained in current folder. Included is comprehensive list of portable appliances, together with their average wattages, blank room settings for arranging furniture and demonstrations of effective use of multi-outlet systems in kitchens, living rooms, bedrooms and dining rooms. (6 pp.)
AIA FILE NO. 31-C-7
MFR: THE WIREMOLD CO.
Circle 324 for further information

UNDERFLOOR DISTRIBUTION

Spang underfloor distribution system components and assemblies for

LITERATURE

power, telephone and intercommunications systems are presented in recent bulletin. Literature describes standard and double-capacity duct and junction boxes for use in conventional concrete floor slab construction, with lift slabs and in other special types of construction except cellular floors. Features square floor pans said to make access box covers practically invisible on tile floors; includes line of service fittings. (20 pp.)
AIA FILE NO. 31-C-7
MFR: THE NATIONAL SUPPLY CO.
Circle 325 for further information

WOOD UNITS

CABINET DOORS

Suggestions for making and installing hardboard sliding doors in cabinets are available in illustrated plan. Units can be made from various types of textured boards, including *Peg-Board*. Included are tabulation of door heights, door pull details, metal and wood track information and construction suggestions.
AIA FILE NO. 35-C-12
MFR: MASONITE CORP.
Circle 326 for further information

HARDBOARD PRODUCTS

General and technical information on line of acoustical, insulating and hardboard products is contained in catalog currently available. Methods of application, physical properties and specifications are described and illustrated. Also included are: four textures of acoustical ceiling tile; standard and random drilled acoustical tile; standard drilled acoustical insulating roof deck; decorative tile and plank; insulating sheathing; roof insulation: 17 varieties of hardboards; and others. (24 pp.)
AIA FILE NO. 37-B
MFR: SIMPSON LOGGING CO.
Circle 327 for further information

FOLDING DOORS

Space-Saver, wood folding doors, subject of recent booklet. Two models available for (1) opening sizes to 10′ high and 15′ wide, and (2) opening sizes to 14′ high and 50′ wide. Features of units are described and colored photographs show suggested applications. Detail drawings and specifications provided. (8 pp.)
AIA FILE NO. 16-M
MFR: WOOD SPECIALTY PRODUCTS, INC.
Circle 328 for further information

FLUSH DOOR CATALOG

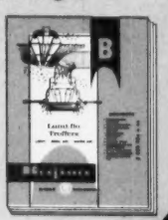
Flush door catalog, illustrated in color, is currently available. Publication stresses details of five and seven-ply hollow core and solid core flush

Circle 146 for further information about THOMAS INDUSTRIES ➤

The Benjamin *Lumi-Flo* is a completely unique recessed LIGHTING troffer, designed for direct connection to HEATING and/or AIR CONDITIONING. Positive proof of its performance and outstanding appearance is provided by hundreds of installations. *Lumi-Flo* employs the low velocity principle of air handling, introducing air straight down into the room. Drafts are eliminated — hot and cold spots are overcome — lighting efficiency is substantially increased.

Because of its superior engineering and exceptional features, *Lumi-Flo* requires fewer ceiling openings, eliminates unsightly air diffusers and becomes a handsome, functional part of a completely integrated design.

Lumi-Flo also offers you totally new freedom in designing room interiors, since its air distribution is not dependent on walls or partitions. Consequently, modern modular units may now be planned with complete freedom of partition arrangement. A complete selection of closures are available in prismatic lens or louvered types. Simplified installation insures important savings in time and labor costs.



WRITE FOR NEW LUMI-FLO CATALOG — Bulletin B contains complete specifications and installation information. FREE on request from Benjamin Division, Thomas Industries Inc., Louisville 2, Ky., Dept. 4C.

BENJAMIN DIVISION
Des Plaines, Illinois
THOMAS INDUSTRIES Inc.

World's Largest Single Source of Lighting for Home, Commerce, and Industry.

the most advanced design in the commercial field

BENJAMIN LUMI-FLO 3-IN-1 TROFFERS

COMPONENTS

1. Duct collar, fits 5" clean opening.*
2. Fiberglass tubing. Flexible, compressible, neoprene impregnated, fire-retardant. May be cut in field to suitable length.*
3. Adjustable volume control valve.*
4. Diffusing plate.
5. Inner reflector.
6. Troffer housing.
7. Shielding element.

**Supplied by sheet metal contractor.*

PROVED AT THE HARRIS TRUST & SAVINGS BANK, Chicago, Illinois
. . . and in hundreds of other installations, including:

STATE SERVICES BUILDING, Denver, Colorado
PARKE-DAVIS BUILDING, Ann Arbor, Michigan
STATE OFFICE BUILDING, Indianapolis, Indiana
I. B. M. CORPORATION, Endicott, New York
WESTERN ELECTRIC CO., Allentown, Pennsylvania
UPJOHN COMPANY Menlo Park, California
GEORGIA POWER CO., Atlanta, Georgia
THE BANK OF CALIFORNIA Berkeley, California
FIDELITY CASUALTY INSURANCE CO., Jacksonville, Florida

U.L. Listed for Lighting, Heating, Cooling

This modern design troffer — only 4⅞" deep — permits reduction of plenum depth — offers additional structural freedom between floors. Engineered to Benjamin's nationally-recognized quality standard, this new shallow-line troffer has been performance tested in the Benjamin lighting fixture laboratory.

Five basic sizes provide complete versatility — 2′ x 4′, 2′ x 8′, 1′ x 4′, 1′ x 8′ and 2′ x 2′. The most complete selection of lenses or louvers in the lighting industry provides a type to meet every requirement.

A Benjamin lighting sales engineer is always available to help you with your lighting plans.

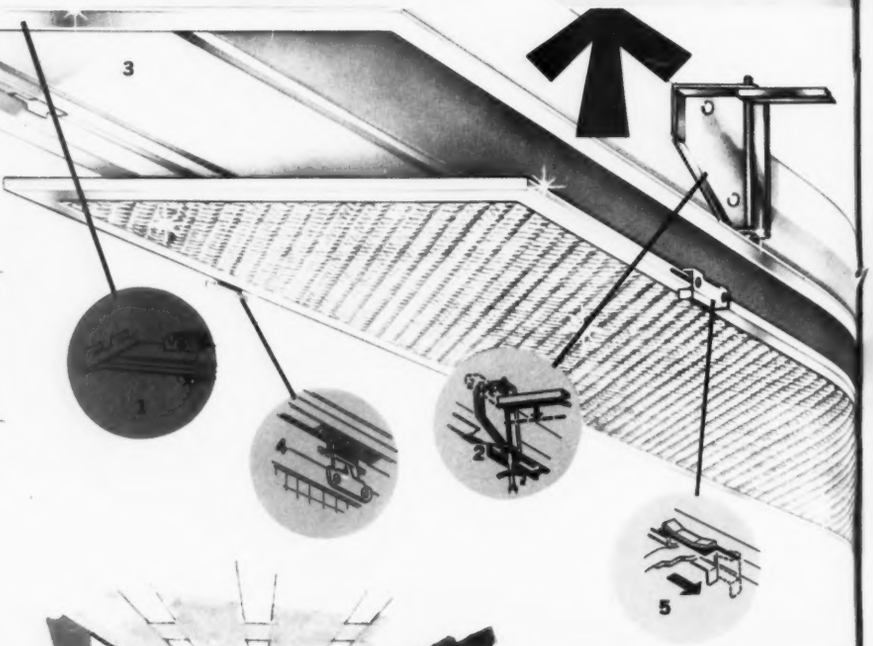
1. **NEW SNAP-IN SOCKET** — simplifies installation — locks in firmly, eliminates vibrations.
2. **NEW SWIVEL SUSPENSION** — quick installing swivel bar mechanism cuts labor time and cost. ¼ turn of 4 screws suspends unit.
3. **NEW ONE PIECE HOUSING** — unitized 4′ and 8′ fixtures possess maximum structural strength.
4. **SUPERIOR HINGING MECHANISM** — so simple it merely drops into place—no screws to tighten.
5. **UNEQUALLED TAB-LOCK LATCH**—provides easy, positive action, gives permanent rattle free fastening.
6. **PROTECTED AGAINST OVERLOAD** — cartridge fuse installed in every unit as added safety feature.

NEW FROM BENJAMIN

THE WORLD'S MOST COMPLETE LINE OF ARCHITECTURALLY ENGINEERED

SHALLOW-LINE TROFFERS

4⅞"



1′ x 4′ Troffer, shown with Benjamin's exclusive L-120 low brightness lens. Maximum light transmission plus effective brightness control.

2′ x 4′ Troffer, shown with Holophane No. 6025 Lens. The finest in concave molded plastic.

2′ x 2′ Troffer, shown with Owens Corning Fiberglas Lens. New flat polarizing light diffusing panel, reinforced with fiberglas flake.

BENJAMIN DIVISION
Des Plaines, Illinois
THOMAS INDUSTRIES Inc.
World's Largest Single Source of Lighting for Home, Commerce, and Industry.

SEND FOR THIS NEW 52 PAGE CATALOG — gives complete technical information and specifications on Shallow-Line Troffers. Request Bulletin A: Benjamin Division, Thomas Industries Inc., Louisville 2, Kentucky, Dept. 4C.

doors, *Seven-Eleven* ceiling height doors and *Bifold* doors. Manufacturing details, photographs of available face veneers and drawings of typical cores are included. (4 pp.)
AIA FILE NO. 19-E-1
MFR: SIMPSON LOGGING CO.
Circle 329 for further information

PLYWOOD PANELS

Laboratory Report No. 82 gives details of tests aimed at developing economies in design methods for plywood stressed skin panels. Panels were tested for effects of stringer spacing, shear deflection, panel skin splicing and handling of headers and blocking.
AIA FILE NO. 19-F
ASSN: DOUGLAS FIR PLYWOOD ASSN.
Circle 330 for further information

HARDBOARD GUIDE

Uniform Nomenclature and Specifications for Hardboard offered, in single copies, intended as guide to recommended hardboard terminology and standards. Based on recommendations by eleven member mfrs, publication defines hardboard as material of commerce, describes classes with regard to type, thickness and strength and outlines specifications. Information on standard panel sizes, tolerances and other criteria also included, with specific performance and tolerance data in tabular form. Standards and uses for special products, from planed standard to decorative laminate cores also covered.
AIA FILE NO. 19
ASSN: HARDBOARD ASSN.
Circle 331 for further information

OFFICE AIDS

ELECTROSTATIC PRINTER

Kecofax Projector-Printer, electrostatic system capable of making prints from 8½" by 11" to 34" by 48" from miniature negatives, is described in current bulletin. Photographs of unit are presented and principles of operation are given. Specifications are included for equipment which is described as adaptable to 35mm, 70mm and 105mm negatives. (8 pp.)
AIA FILE NO. 35-H
MFR: KEUFFEL & ESSER CO.
Circle 332 for further information

OFFICE PLANNING

Illustrated folder offered, entitled, *The Right Way to Office Planning*. Purpose of literature is to explain methods of utilizing office space more efficiently, present methods for achieving increased work flow and utilizing extra space within current floor area, through use of modular office furniture components and free-standing partitions for departmental and individual work needs. Typical office installations are illustrated, ranging from single work stations of receptionists to entire offices, with modular steel desks and *Partitionettes*, partitioning units. (12 pp.)
AIA FILE NO. 35-H
MFR: ROYAL METAL MFG., CO.
Circle 333 for further information

METALS/GLASS

PERMANENT GRANDSTANDS

Current brochure describes permanent steel grandstands in various sizes. Literature describes construction features which reportedly provide maximum seating capacity, spectator comfort, easy traffic flow, safety, durability and adaptability to terrain requirements. Diagrams presented to show units' clear understructure. Design specifications and descriptions of component materials provided, in addition to listing of optional features. (4 pp.)
AIA FILE NO. 13-J-1
MFR: STANDARD STEEL BLEACHER DIV.
Circle 334 for further information

GLASS REVIEW

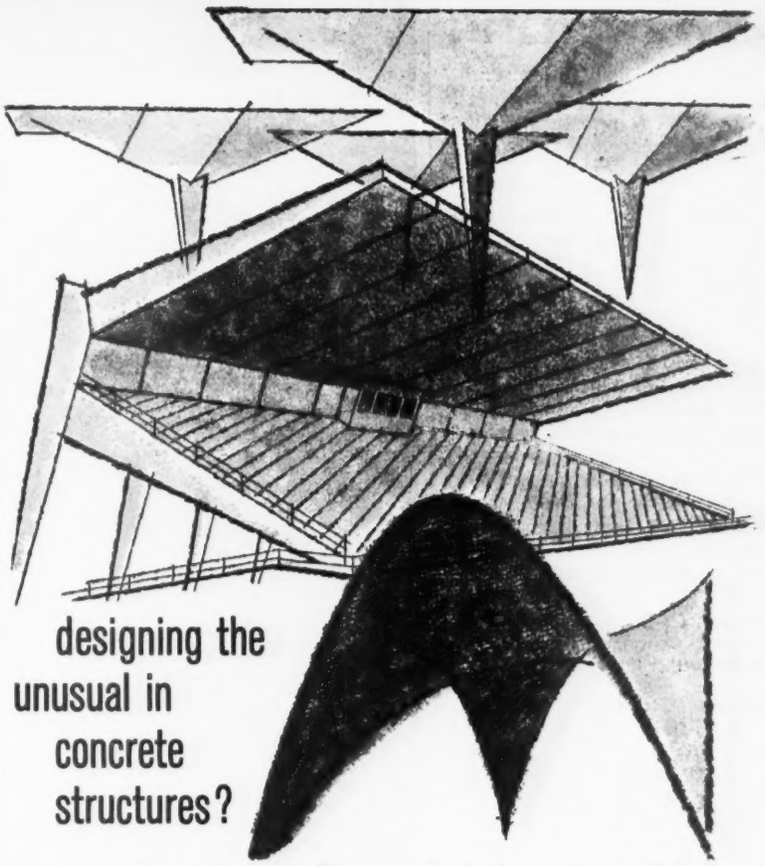
Creative Ideas in Glass is recent quarterly review of currently interesting and creative applications of glass in modern architecture. Initial issue highlights use of wired glass in skyscrapers, schools, apartment houses and public buildings. New York's 47-story Time & Life building, two schools by Minoru Yamasaki, apartment buildings by Kelly and Gruzen and others are illustrated as recent applications of material. Future issues will be devoted to single topics—e.g., lighting, glare reduction, interior design, etc.
AIA FILE NO. 26-A
MFR: AMERICAN-SAINT GOBAIN CORP.
Circle 335 for further information

WELDING OF METALS

Current booklet is reprint of article from *Metalworking* magazine, which deals with problems encountered in welding metals of comparatively recent origin. Literature offers review of problems involved in joining such metals and alloys as PH stainless steels, ultra-strength steels, rene 41, beryllium, zirconium, molybdenum, tantalum and columbium. Tabular presentation of process data on four of these metals also contained. (8 pp.)
AIA FILE NO. 13-C-2
MFR: AIR REDUCTION SALES CO., DIV., AIR REDUCTION CO., INC.
Circle 336 for further information

ALUMINUM BROCHURE

Recently published technical brochure describes primary and mill products. Brochure reviews full range of shapes, sizes and alloys available in primary aluminum pig,



designing the unusual in concrete structures?

remember to protect them against the ravages of time

Even the most delightful flight of fancy in prestressed concrete can eventually become unsightly and even unsafe through erosion and corrosion. Sometimes sooner than we like to think. One simple, low-cost assurance of long life is to specify vulnerable surfaces be coated with Thoroseal. This fine cementitious material will protect against moisture penetration and usual corrosion and it becomes a decorative surface in any of several colors, gray or white. Add to your files our specification guide describing Thoroseal and all other Thoro System products for masonry protection. Use the coupon below.

Please send me your free new specification guide.

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Plants at New Eagle, Pennsylvania and Centerville, Indiana

Circle 147 for further information

◀ Circle 146 for further information about THOMAS INDUSTRIES

LITERATURE

ingot and billet, and in wrought aluminum mill products. Metallurgical tables and design information included as reference aid for designers and engineers. Among subjects are light and heavy press extrusions, press forgings, hand forgings, impact extrusions, pipe, tubing and alloy characteristics. (12 pp.)
AIA FILE NO. 15-J
MFR: HARVEY ALUMINUM
Circle 337 for further information

MISCELLANY

MORTISE LOCKS

Catalog section now offered covering mortise locks and latches. Information presented to describe features of *6700, 7700, 7800* and *7900* series. Also included is data on handle sets, miscellaneous locks and trim, of screwless and colored types. (32 pp.)
AIA FILE NO. 27-B
MFR: SARGENT & CO.
Circle 338 for further information

FASTENING TOOLS

Catalog issued on *Ramset*, powder-actuated fastening tools and accessories, and *Shure-Set*, hammer-in fastening tool. Both systems are designed to eliminate need for drilling and setting expansion anchors. Catalog contains technical data and illustrations, and information on working loads.
AIA FILE NO. 17-F
MFR: OLIN MATHIESON CHEMICAL CORP.
Circle 339 for further information

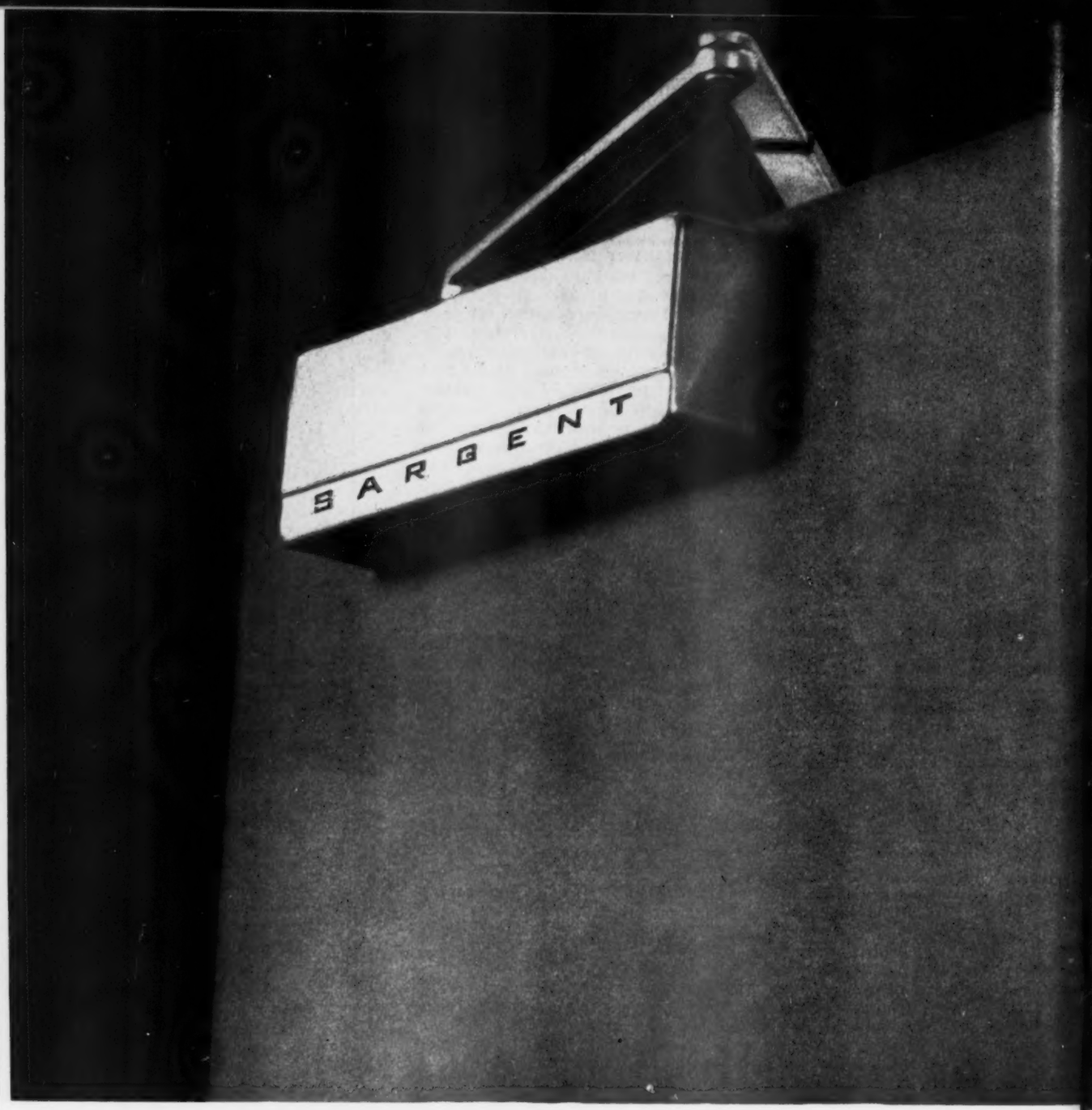
COLORED COATING

Vynatex 23, colored protective coating for asphalt pavements, suitable for both indoor and outdoor use, is described in current bulletin. Material and its available colors are described and portrayed. Bulletin also features: light reflection and absorption charts; color reaction chart dealing with relation between color choice and morale of personnel; and such suggested uses as industrial plants, decks and courts, tennis courts and commercial establishments. (4 pp.)
AIA FILE NO. 11
MFR: MAINTENANCE, INC.
Circle 340 for further information

BID SHOPPING

A Discussion on Bid Shopping, pamphlet currently available, contains transcript material from recent panel discussion of provocative subject. Panelists included R. C. Dickerson, *Associated General Contractors*, John Noble Richards, FAIA, *American Institute of Architects*, Frank H. Inscho, Jr., *Plumb-*

Circle 148 for further information ➤



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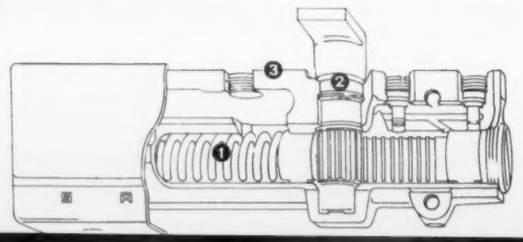

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specifications for conventional type. For all applications, all door sizes... exterior and interior. Call your Sargent supplier or write Sargent & Company, New Haven 9, Conn.

SARGENT

The newest fashion in a complete line of architectural hardware

LITERATURE

ing Contractors' National Legislative Committee, Arthur R. Elsperman, *St. Louis Bidding Practices Board* and Paul N. DuVal, *Canadian Construction Assn.* Suggested solutions vary from legislation to ostracism. (48 pp.)

AIA FILE NO. 40

ASSN: CONTRACTING PLASTERERS' AND LATHERS' INTERNATIONAL ASSN.

Circle 341 for further information

SPACE SAVING UNITS

Free-Way Seating is topical brochure, issued to describe features of table and chairs combination units. Model *TC-65* shown as able to provide 10' table and 12 chairs in one folding portable unit. Construction specifications and various dimensions also detailed, with photographs and drawings. (4 pp.)

AIA FILE NO. 35-B

MFR: SICO MFG. CO., INC.

Circle 342 for further information

MODULAR PANELS

Recent brochure treats modular *Dylite* panels said to permit construction economy and greater design freedom. Panels have inner core of expandable polystyrene which is bonded to facings of conventional building materials. Information on sizes and types of available panels given, in addition to housing types for which panels are applicable. (33 pp.)

AIA FILE NO. 23-L

MFR: PLASTICS DIV., KOPPERS CO., INC.

Circle 343 for further information

WATERSTOP MANUAL

Technical manual offered, containing design information on *Kwik-Seal* waterstops. Through text, drawings and photographs, manual covers such subjects as sizes and shapes of waterstops, comparative data for plastic and rubber units, handling and storage of material, design data for both "little" and "considerable" movement joints, application data and instructions for splicing material in only five minutes.

AIA FILE NO. 7

MFR: THE GATES RUBBER CO., INDUSTRIAL DIV.

Circle 344 for further information

WATERSTOP BROCHURE

Illustrated brochure now available, describing polyvinylchloride waterstops. Units reported to serve as expansion joints also, in bridges, dams, parking lots, arenas and foundations for all types of construction. (4 pp.)

AIA FILE NOS. 4-E-11; 7-C

MFR: WALJOHN WATERSTOP, INC.

Circle 345 for further information

← Circle 148 for further information

(Continued from page 12)

make the little exterior area, seem less crowded? If he is forced to build next door to other tall buildings, can he separate his project from the other buildings with light?

Indoors, lighting plays the same role in the planning. Can the architect make a small room seem larger with a luminous ceiling if the ceiling is only eight feet high? If he uses a luminous wall instead, what kind of wall will this require? If he wants a cove, the cove proper is part of the architectural line itself. Does he want inverted domes in the ceiling for reflected light? Does he want to keep all the light sources invisible? When he considers that the inner space belongs to him too, and if he realizes that light is the only material he can use there, he will hardly put the lighting off until his plans are complete.

Lighting is also part of the design of the thin-line between the inner and outer space, the building itself. Here there is no point in creating fine details unless they can be seen. The arch can get lost in the darkness, and the sculptured figure on the facade could also go to sleep at night for all he matters. Such details should be carefully planned in terms of lighting. As for the architecture itself, the lighting should either help it by emphasizing it, or help it by illusion. If the character of the building is deliberately angular, it should be lighted to sharpen the points. But if the lines are unfortunately angular, then the corners should be blurred and softened. The point here is that lighting will create some effect, once the lamps are turned on, and the architect should be concerned that it *is* the effect that he has planned.

Lighting is for people

Essentially, lighting is for people. If they didn't exist, we wouldn't need any lighting. This may appear as naive or simple-minded, but so much of architectural planning today doesn't seem related to people. The fact that they occupy a building once it is finished, is probably a shock to some efficiency planners. If we could only forget people until we turn the building over to the owner and let him open the doors, everything would be lovely.

With lighting though, people do come first, since they are the ones who live in it. This is their only medium for seeing. There are two kinds of lighting for people, the kind in which they take a back seat and observe something outside their lives: paintings, displays, exhibits, plays, speakers, sales objects, etc., and the kind in which they live. In the "objective" situation, the problem of lighting is to enable people to see the objects and to see them in a specific way. The objects have to be dramatized to attract people's attention away from what they are doing and thinking. Quite literally, the lighting has to be distracting.

But there is another kind of lighting where distraction would be incorrect. This might be called the "subjective" situation, where people are living in light, where they are relaxing, talking, reading, walking, working, or doing nothing but just catching up with themselves. This is the situation where lighting cannot intrude on the thinking and doing of whatever activities are in process, but it does affect people and the manner in which they function. If people can see objects readily and in proper perspective so that they can move about easily, and if colors are true so that the world is real enough in which to feel secure, the "subjective" lighting is successful. The light in a room may be perfect from the visual point of view, until someone steps into it. The thing to remember is that people always do go into rooms. In addition to the fact that people are functional beings, we have to consider that they are also sensitive beings. They react emotionally as well as physically. The lighting has a great deal to do with the emotional climate of a room. A room where there is just enough blue in the light—perhaps not even visible to the eye—to make people look wan and somewhat haggard to each other and themselves, is not a room planned for people. We like to look good, everyone of us. It makes us feel good. There is nothing subtle about the need for a warm light in which to live.

Aesthetics in lighting is the concern with bringing beauty to buildings and to people. We bring beauty to buildings because it gives people pleasure to look at them, and we do that by enhancing the building lines, by pin-pointing the design details and by not introducing extrinsic elements on the ceiling and the walls. We light aesthetically for people when we place objects in light with an awareness of how they will be seen, and by surrounding people with light that is comfortable and conducive to being at ease.

Role of the lighting designer

Today lighting has become such a monster that more and more architects are turning to the lighting designer for help, although sometimes too late. If called in at the planning stage, he has a chance to the things he is asked to do.

The lighting designer acts for the architect, not the trades. He tries to realize the architectural design visually, and he tries to provide an inner lighting suitable to the kind of living that will be going on inside. In the process, he often finds he is educating the architect and the client to the public's needs. But this is his business.

Since he works directly with light, the lighting designer becomes the 'fly in the ointment' where the lamp and fixture manufacturers are concerned. This is as it should be. It is he who creates the demand, not they. It is he who should be able to advise these companies on the architect's needs.

Acting as one with the architect, he knows the specific problems, as they cannot since he and the architect are aware of the over-all design problems. If he often breaks through the mass-production approach with a demand for a new lamp and later, a new fixture, to handle a specific problem that has not been solved before, this is as it should be. If the architect can't request from the manufacturers that the lighting industry keep up with the new architectural concepts simply because he doesn't know what to ask for, then the lighting designer must do it for him. Again, this is his business.

Last, and certainly not least, there are people. The lighting designer studies light moving in space, and then he puts people into that light and studies the changes as they move. If he forgets for an instant that he is lighting for people, then hehas lost his value to the architect. Light is for people first, and abstract goals have no meaning in themselves.

NEW

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FLUORESCENT TROFFERS

Latest addition to Pittsburgh Reflector Company's full line of quality Fluorescent and Incandescent Lighting Equipment.

Designed to fit virtually any ceiling system, easy to install and maintain, remarkably efficient, these new Fluorescent Troffers are winning quick acceptance from men who recognize the need for quality, versatility and flexibility in lighting equipment. Ideal for commercial, institutional and public buildings.

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WIDE CHOICE OF CLOSURES

Designs Unlimited! New, highly versatile, modern styled Pittsburgh Fluorescent Troffers fit virtually every ceiling type. Variety of closure styles assure the right application for every need. Available in four and eight foot sections for individual or continuous row installation.

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COMMUNICATIONS

A/E NEWS welcomes the opinions of its readers. Letters should be addressed to: Editor, Architectural and Engineering News 452 Fifth Ave., N. Y. 18.

Ad astra per aspera

Editor:

Another good issue, friend Carlos. This is just a note of thanks for the treatment given the AIA-NSF conference on Research for Architecture and an aside in connection with the little goof on page 15 in the title of Allen Pond's talk, (Agriculture for Architecture). This suggests a new profession, agritect.

Eric Pawley, AIA
AIA Research Secretary
Washington 6, D. C.

Editor:

The gremlin that changed Architecture to Agriculture in Allen Pond's paper "Environmental Hygiene and its meaning for Agriculture" may also have positioned the black line pointing toward his achievement. Seriously, I thank him, for attracting me to this article emphasizing the immense amount of biomedical and related research findings becoming available. I hope that our profession is able to interpret, and make practical use of this knowledge.

Sincerely yours,
Alfred J. Porteous, AIA,
Wright, Porteous & Associates, Inc.
Architects and Engineers,
Indianapolis 2, Ind.

De gustibus non est disputandum

Editor:

ERRATUM:
The article by Allen Pond appearing on page 15 of this issue should be correctly entitled, "Environmental Hygiene and (It's) Meaning for Architecture."
OUCH!

Erratum . . . Erratorum!
Architect (Anon.)
Boston Neck Road
Suffield, Conn.

Editor's Note: *Double ouch!! Errare humanum est.*

Editor:

Can you advise me of a book on the renovation of large commercial buildings?

George H. Amber, PE
Amber and Amber
Consulting Engineers
Detroit 35, Mich.

Editor's Note: *We are sending you, under separate cover a list of the outstanding book publishers in this area. However, in a more frivolous moment, may we suggest that you consult a good architect?*

Editor:

I read with extreme interest your article in the March 1960 issue concerning the geodesic dome and new headquarters building which we constructed for the American Society of Metals.

I was considerably dismayed, however, to note that we as the general contractors were not given so much as a credit line. Frankly, I thought that this was standard practice on your part. . . . This was one of those unusual projects where we as the general contractors were retained at approximately the same time as the architect and were therefore given the opportunity to work very closely with both the architect and the owner in the development of this most unusual structure. This, I suppose, is the main reason why our noses are somewhat bent by being left out of what was otherwise a very fine article.

Yours very truly,
Alan H. Gillmore, Jr.
Vice President
The Gillmore-Olson Co.
Cleveland 3, Ohio

Editor's Note: *Although the bulk of our circulation, (34,000 copies) is directed to registered architects and consulting engineers, we do, from time to time, credit GC firms for their participation in projects. Therefore, please accept my apology for having excluded your firm from receiving the credit to which it was properly entitled. I trust, that this in a small way, may rectify this editorial deficiency.*

Editor:

In a news release which we sent out on November 20, 1959, and which you published in your issue of February, 1960, we stated that our new Weldwood acoustical door "gives sound control performance which the American Society for Testing Materials certifies to be more effective than that of other doors in its range."

This was an error, resulting from a misunderstanding, which we deeply regret. In fact, the door was tested by the Riverbank Acoustical Laboratories of the Armour Research Foundation, Geneva, Ill.; but (as the Riverbank report states) "the method used in making these measurements . . . meets explicitly the standards of . . . the American Society for Testing Materials."

Our error has caused the Society considerable embarrassment, since, as a standard-setting agency, it certifies nothing itself. We would be very grateful if you could see your way clear to printing a correction.

Sincerely,
John W. Gerber
Public Relations Manager
United States Plywood
New York, N. Y.

Editor:

In case you're confused—this is in answer to the epistle published in your otherwise excellent April issue—it need not be printed—unless you believe in 'equal time'. . . . Please, by all means, include Mr. D. A. T. (Thorp) P.E., of Jackson, Michigan, among your subscribers.

Since I am a registered architect in Michigan and quite conversant with the architectural design quality of the office he represents, a fine magazine such as yours can only add substantially to their architectural creations; maybe as much as 100 per cent.

Very truly yours,
Linden C. Pettys
Architect
Ann Arbor, Mich.

Editor:

In search of a list of the 20 leading architectural firms in Chicago, I have been referred to you. I do not know whether the criterion would be total dollar value of construction supervised, total billings, or some other measurement, but would appreciate any such list if you should have one available.

Thank you for whatever help you may be able to give.

Sincerely,
A. R. Magee
Associate Director
Chicago Central Area Committee
For Strengthening and Improving
the Chicago Central Area
Chicago, Ill.

Editor's Note: *It is very difficult to establish criteria for what constitutes a "leading" architectural firm in a given area. Size in terms of personnel or dollar value may be a form of measurement—but it has very little to do with ability, talent or specialized professional service. Accordingly, your question is being referred to the Chicago Chapter of the American Institute of Architects. We believe it can be of some assistance.*

LOW COST

UNIVERSAL II FLUORESCENT TROFFERS

• LOW INITIAL COST
• LOW INSTALLATION
• LOW MAINTENANCE

The new Pittsburgh Fluorescent Troffers are shipped fully assembled and completely wired for immediate installation. All major components—troffer, closure, flanges—are interchangeable. Exclusive Adjusti-supports assure snug adjustment in any ceiling. All metal parts are prefinished by Duranodite process. Easy to clean, easy to re-lamp.

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Circle 198 for further information

EFFICIENT

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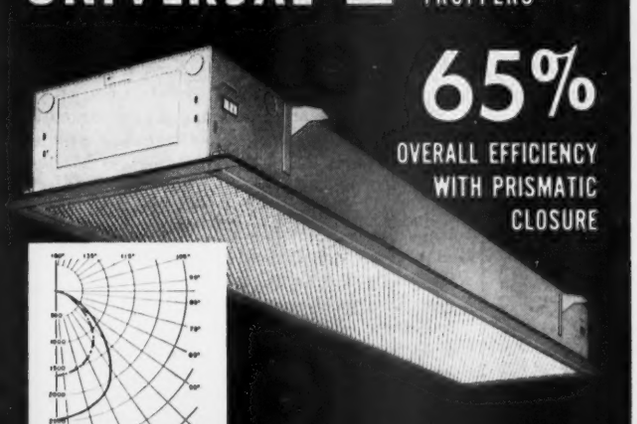

The most efficient line of Fluorescent Troffers! Die-formed to prevent light leakage, thus assuring maximum light output for every closure style. Hot bond sprayed and baked with synthetic white enamel with 89% reflectance.

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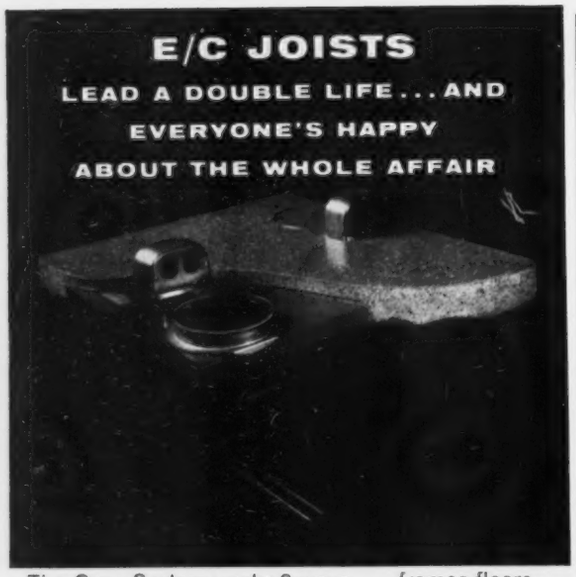

The Ceco System works 2 ways . . . frames floors—carries underfloor electrification

Buildings to be truly modern need underfloor electrification . . . on that everyone agrees. And there is a system that serves a double purpose. It is the Ceco Electro-Channel Steel Joist System which uniquely carries both the electrical and structural loads. With the savings inherent in steel joist construction, underfloor electrification is now practical for almost any new building, large or small. Send for facts. Ceco Steel Products Corporation. Sales offices, warehouses and fabricating plants in principal cities. General offices: 5601 West 26th Street, Chicago 50, Illinois.

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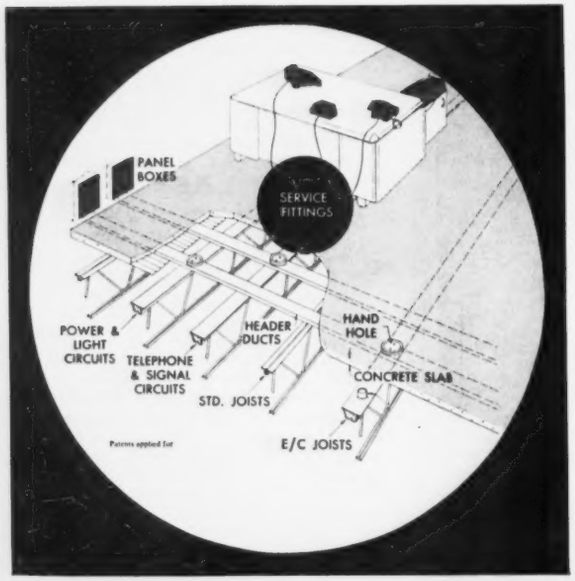
TOTAL MANUFACTURING FOR THE BUILDING INDUSTRY FROM RAW TO FINISHED PRODUCTS



Circle 149 for further information

NAMES

(Left to right) Lester W. Smith, Willis N. Mills and Thorne Sherwood.

Architecture is for people—this is the credo around which Thorne Sherwood, FAIA, Willis N. Mills, AIA, and Lester W. Smith, AIA, original partners of the Stamford, Connecticut architectural firm that bears their names, have built their practice.

Sherwood, Mills and Smith believe that it is the architect's responsibility not only to solve basic structural problems, but also to provide buildings which are emotionally and spiritually satisfying—in the fullest sense—to the people who use them. As the largest architectural firm in Connecticut, Sherwood, Mills and Smith have attempted to demonstrate their regard for architecture as a creative service profession in the many and varied buildings they have designed. They were the architects for such prize winning buildings as the Mutual Insurance Co. home office in Hartford, Conn., the Stamford Dorr-Oliver building, and the Barden Co. plant in Danbury, Conn. They have designed more than 100 schools, as well as hospitals and churches.

Currently the firm has on its boards plans for the new quadrangle at Princeton University, a group of buildings at Brown University and St. Mark's Episcopal Church in New Canaan. It also is designing a number of experimental institutions including the new high school in Cold Spring Harbor, N. Y., and the government sponsored, bi-lingual American School in Guatemala City, Guatemala.

In 14 years, Sherwood, Mills and Smith have grown from a one-room, three-man partnership with a part-time secretary, to a firm with seven partners, a staff of forty, with a central office and a drafting annex. All seven partners are registered architects, certified by the NCARB.

The original plan for the firm came at the end of the war, after the three partners had seen war service: Sherwood in the U. S. Navy; Mills with the U. S. Marine Corps and Smith with the U. S. Army Air Force.

Thorne Sherwood joined with Mills and Smith in 1946, following his Navy service and a brief period in private practice in New York. Born in Montclair, N. J., in 1910, Sherwood attended Williams College (B.A. 1932) and the Columbia University School of Architecture (1936). He held the Perkins-Boring Columbia University Traveling Fellowship in Europe in 1937 and 1938.

A relaxed, casual man, whose youthful air and loose-limbed amiability sometimes give a false clue to his maturity and the deep intensity with which he regards his profession, Tony Sherwood feels that the architect bears a heavy responsibility as part of a scheme to pattern total environment. "Environment has great impact on the people within it," he has said. "It can be humiliating, and degrading, or just plain dull—or it can be elevating and answer man's highest aspirations. At a time when building and construction stand first in the nation's industries, the obligations of the architect to mankind are enormous. The implications involved in the implementation of government and private development projects in town and country planning are almost limitless. But if the obligations are demanding, the rewards to the architect are equally great."

Willis N. (Plumber) Mills joined forces with Sherwood and Smith after service in the Pacific. Decorated for his part in operations at Guam and Okinawa, Plumber Mills has consistently refuted the nickname he received at prep school—given originally, he says, because of a brilliant adolescent

propensity towards "lousing things up." Only the nickname has persisted.

Born in Michigan's upper peninsula, Mills lived his early years in many parts of the United States, attended Kent School, the University of Pennsylvania (B.A. 1925) and the University of Pennsylvania School of Architecture (1929). He worked with Shreve, Lamb and Harmon, and later with Norman Bel Geddes on the New York World's Fair, and spent a number of years in private practice. Early in the thirties he was an instructor in architecture at Columbia University, and married architectural student, Esther Stehle. Mrs. Mills, continuing her professional interest in architecture, heads the firm's color department.

Plumber Mills thinks the future of architecture is stimulating and brighter than ever before, and that we may be entering one of the great periods of architectural development. "The challenge ahead," he says, "is that architects must be planners in a broader sense than ever before—they must go beyond the planning of a single building or group of buildings and learn to plan a total environment."

Lester (Les) W. Smith is perhaps the most personally reticent of the three founders of Sherwood, Mills and Smith. His brilliant academic record began with his election to Phi Beta Kappa at Princeton University, and his graduation from that institution with highest honors in architecture in 1930. The following year he attended the Fontainbleau School of Fine Arts, near Paris. He was a finalist in the National Paris Prize Competition for the next three years and received his M.F.A. from Princeton in 1933. Returning to this country the following year, he worked for such firms as Harrison and Fouilhoux, Hoggson Brothers, Philip L. Goodwin, Morris and O'Connor and Voorhees, Walker, Foley and Smith. In 1941 and 1942 he was the chief designer and site planner for Caribbean Architect-Engineer, Trinidad, B.W.I.

Of all three partners, Smith is the most impatient with architectural practice which puts artistic considerations before human beings. "I believe strongly that architecture should be concerned with what it can contribute to living; it should consider how, through construction and design, it can add to the morale of the people using the building. This is especially important in institutional building, such as schools and hospitals, where a gay, happy, cheerful building can add immeasurably to the well being of children or patients, and the staff."

Smith's preoccupation with the "living" aspect of architecture, has been borne out by the numerous prize winning schools he has designed for Sherwood, Mills and Smith. Many of these have been widely featured in the architectural and educational press, and his articles concerning the special aspects of school building have been widely published.

DIGEST:18

NATURAL LIGHT SOURCE UTILIZATION

A/E NEWS presents a digest of a paper by J. W. Griffith, Associate Professor of Industrial Engineering at Southern Methodist University, which was presented at the Building Research Institute Conference on Building Illumination held May, 1959.

Designing lighting

In designing lighting for any type of installation, one must first decide on the necessary level of illumination for adequate performance of the task. Secondly, this level of illumination must be obtained in such manner that it does not interfere with the performance of the task. This simply means that in designing the lighting we must be aware of the quality as well as the quantity of illumination. With the higher levels of illumination this quality aspect of lighting becomes more important.

In designing quality illumination one must remember that large areas of low brightness produce higher quality illumination than do equivalent small area sources. This is due to the fact that small area sources must be considerably brighter to give the same levels of illumination on the work plane as large area sources. Consequently, in designing daylighting in buildings it is much more desirable to have very large areas of daylight rather than many small area sources. When large area sources are used, the adaptation of the eye remains at a high level and quality lighting is obtained. When small area sources are used to obtain high levels of illumination, the eye is seeing a field of view that is constantly changing from high brightnesses to low brightnesses. With the normal motion of the eye the variation between high brightness areas and low brightness areas produces an undesirable effect on the eye adaptation.

Form of control

Under certain daylighting conditions the sky brightness through a window becomes too bright for quality illumination. Consequently, some type of control is necessary. In fact, in designing daylighting for higher levels of illumination the choice of the daylighting control is much more critical than in designing for lower levels of illumination.

Daylighting controls fall into two basic categories; fixed controls and variable controls. Fixed controls are those for which the occupant has no choice of the amount of illumination coming into the room. This type of control can be either natural or artificial. The natural control may be trees or orientation of the fenestration such that sunlight does not enter the room. Some types of fixed controls are an integral part of the fenestration. This type of control may be diffusing glass, heat absorbing glass or a combination of diffusing glass with a clear vision strip. It may also be a prismatic control such as prism glass or glass block which employs an egg crate louver effect in its installation.

Many fixed controls are not integral parts of the fenestration. This type of control may be an overhang that is opaque, louvered or translucent. It may also be a horizontal or vertical louvered wall. The fixed daylighting control is generally employed for reasons other than daylight utilization. In the case of the overhang construction it may provide shielding from excessive heat loads, and at the same time provide an exterior corridor for inclement weather conditions.

Variable controls are controls for which the occupant may change the amount of daylight coming into the room either manually or automatically. The roller shade and draw drape are examples of this type of control. The shade or drape can be opened when overcast skies prevail and closed under high sky brightness or sun conditions.

Utilizing louvers

Various types of adjustable louvers have been used for daylighting controls. Generally the horizontal louver or venetian blind has been the most acceptable type of louvered control. With the venetian blind, the occupant can remove the control on dark days or adjust the control on exceptionally bright days in such a manner as to utilize the daylighting and still control it for any desired brightness. When sun is on the fenestration area, the blinds can be adjusted such that no sunlight may enter the room directly. With proper adjustments the venetian blind becomes a luminous panel permitting sunlight or high sky brightness to enter the room only by reflection off the blind itself or the ceiling and upper part of the walls. This type of control permits the best utilization of sun and sky light reflected off the ground. It permits illumination from below the horizon to pass through the louvers more or less unobstructed to the ceiling for indirect daylighting within the room.

Vertical louvers have been used to a lesser degree for daylighting control. The vertical louver is usually a fixed louver, but it does not have to be such. The vertical louver is not as efficient as the horizontal louver, but has the advantage that clear vision can be obtained in a downward direction while the louver is adjusted for complete cutoff of sunlight.

Various combinations of daylighting control permit a wide range of daylight utilization. In many cases a combination of fixed control and variable control produces a very desirable lighting installation. Combinations of overhang control with variable controls, such as roller shades or venetian blinds, permit greater utilization of daylight and desirable exterior effects.

Emphasis on ground reflectance

With higher levels of illumination on the work plane, new emphasis must be placed on the importance of ground reflectance. Where sunlight is not incident on the fenestration, but is incident on the ground, the illumination coming from the ground may be the primary source of daylighting. Since the ground illumination is reflected into the room and off the ceiling and upper walls, it is the most desirable type of daylighting. Not only is it indirect daylighting, but it also produces higher brightness on the ceiling and walls with balanced brightness in the field of view.

It is the responsibility of the illuminating engineer to analyze and specify the reflectances of areas immediately adjacent to fenestration walls for better efficiency in daylighting. Where fixed controls are employed, it is even more important that ground reflection and reflection from exterior surfaces be utilized to the utmost.

Multilateral daylighting design

With the new emphasis on utilization of lighting sources, there will be a renewed interest in multilateral daylighting design. By employing more than one window wall in a room or skylights, larger areas of daylighting can be obtained and, consequently, greater levels of illumination on the work plane. Multilateral daylighting has an additional advantage in that it can produce uniform levels of illumination throughout a room. This uniformity is sometimes referred to as quality lighting. This is in error as many times the asymmetric distribution of unilateral daylighting is desirable. If the recommended levels of illumination for various tasks are analyzed, one sees that different levels of illumination are required for the different tasks. Consequently, the asymmetric distribution of daylighting can be capitalized upon by placing

the tasks requiring higher levels of illumination near the fenestration area and low level tasks in the room away from the fenestration.

When multilateral daylighting is used, the area sources should be large as with the case of unilateral daylighting. This is particularly true when skylights are used. The area sources of skylights should be large in size with a reasonable ratio of skylight brightness to ceiling brightness. Since most of the daylight from skylights is direct lighting, the entire daylighting system should utilize ground lighting to lower the ratio of brightness between the skylight and ceiling.

Daylight is one of our basic resources. In fact, it is so natural that people have taken it for granted and ignored the abundance of low cost lighting available. The lack of daylight utilization in the past has been partially due to the fact that daylight prediction within rooms was impractical. Most of the daylight prediction techniques prior to World War II did not consider interreflectance within the rooms. Furthermore, they were simplified to such an extent that they were not effective.

Prediction techniques

With the growing interest in daylight walls immediately following the end of World War II it became apparent that a prediction technique for the distribution of daylighting within buildings was necessary for better utilization of daylighting. At this time Libbey-Owens-Ford Glass Co. co-sponsored a daylighting research project at Southern Methodist University. The ultimate goal of this project was the development of a practical daylighting prediction technique for various types of controls under varying exterior and interior conditions for adequate daylighting designs.

In the early years of this project it was limited to field observation and observations in a full sized test cell under natural daylight. Under such conditions the variability of exterior conditions was such that a prediction technique could not be developed.

To obtain the necessary data for developing a daylighting prediction technique, an artificial sky 20′ in diameter was constructed in the daylighting laboratory at Southern Methodist University. Under a series of fixed sky conditions and sun conditions, controlled tests showing the effects of the various interior and exterior conditions were obtained. These tests were obtained on 1/12 scale model rooms with varying widths, lengths and ceiling heights. Various wall reflectances and exterior conditions were studied for both no control and controlled conditions.

After five years of daylight testing under the artificial sky with some 2,000 different rooms and exterior conditions the L.O.F. prediction technique was developed. Part of this testing was under natural conditions to verify the the validity of the prediction technique developed in the laboratory.

This prediction technique is a lumen method of daylighting design. It is based on the total incident illumination on the fenestration area. Since the illumination from below the horizon is indirect lighting within the room and illumination from above the horizon is mostly direct lighting, it is necessary to predict the illumination within the room from each type of source separately. The illumination from direct sun incident on the fenestration area is distributed differently to that of sky light with no sun on the fenestration area, since direct sunlight within the room is not usually desirable and some type of sun control is necessary to illuminate it.

The daylight distribution within a room from a particular exterior condition is predicted for three locations within the room. These three locations are on a center line perpendicular to the wall of the fenestration under study. The maximum point is located 5 feet in from the fenestration wall, the minimum point 5 feet in from the wall opposite the fenestration area, and the mid-point is in the center of the room. The illumination is predicted at a work plane height of 30″.

The illumination from the sky (or sun and sky if the sun is incident on the fenestration area) is predicted and then the illumination from the ground. All of the values of the illumination from each source are then added to obtain the total daylight illumination at any one prediction point. In the case of the multilateral daylighting the illumination is predicted for each fenestration area separately. It should be noted that in multilateral daylight predictions the maximum point for one fenestration area may be the minimum point for another fenestration area.

A method of prediction

After a particular exterior condition has been established, the actual prediction of the daylight distribution within the room is quite simple. The daylight at any of the three prediction points can be computed from the equation:

$E = E_i \times A_f \times C.U. \times K$ where

E = Work plane illumination at the particular point

E_i—Illumination incident on the window from a particular source (sky, sun and sky or ground)

A_f—Light transmitting area of the fenestration

C.U.—Coefficient of utilization for a particular fenestration (and/or fenestration and control)

K—Numerical multiplying factor

It is not economically feasible to develop a daylight prediction technique that would cover all possible daylighting designs. However, this daylight prediction technique has been expanded to cover most practical daylighting designs. It has been amplified to cover daylighting controls such as overhangs, venetian blinds, and diffusing controls. The technique was originally designed to cover rooms varying from 10 feet to 40 feet in length and width with ceiling heights from 8 to 14 feet. Recently the technique has been applied to rooms 80 feet long and 40 feet wide with satisfactory results.

The simplicity and ease of the prediction technique can only be appreciated by studying various examples of its application. The complete technique with examples and all the necessary tables to determine the exterior lighting conditions is available through literature of the Libbey-Owens-Ford Glass Co. Excerpts from this prediction technique are available in various papers presented before the Illuminating Engineering Society from 1953 to 1957.

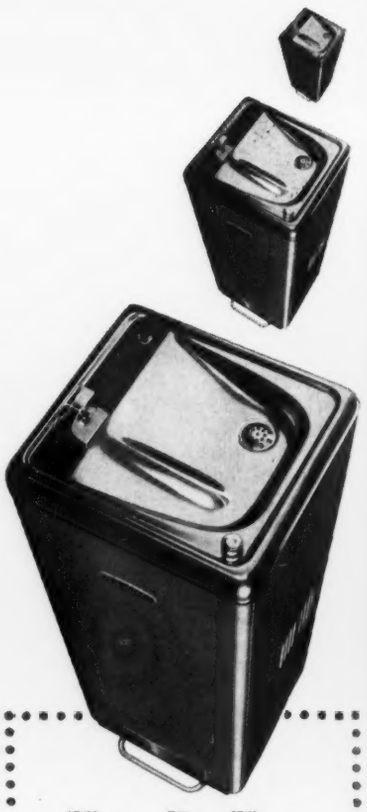
Determining exterior conditions

The biggest problem involved in predicting daylight distribution within a room is in determining the exterior conditions. There are an infinite number of sun and sky conditions for any particular building site. However, in general, it is only necessary to predict the illumination for a few particular conditions. To assure adequate quantity of illumination one design condition generally chosen is that of minimum daylighting. This is usually a dark overcast sky that would produce only 500 footcandles incident on the fenestration area. Another design condition would be that of maximum sunlight. If a variable control device is used, all conditions between the maximum and minimum condition could conceivably be controlled if these two conditions are satisfactory. In the case of overhang design several sun conditions representing different times of the year may be necessary to assure satisfactory control.

Making comparisons

In making comparisons between predicted values of daylight distribution and measured values under natural conditions it is absolutely essential that all exterior conditions be properly evaluated. No existing design can be evaluated if the exterior illumination values have not been recorded as outlined in the *I.E.S. Guide for Measurement and Reporting of Daylighting*. Any attempt to evaluate an installation without this data can produce large errors.

By using prediction techniques for daylighting and artificial lighting, the illuminating engineer can now integrate the two lighting systems to produce the recommended levels of illumination most economically. In correlating the daylighting with artificial lighting, most of the undesirable effects or poor color rendition, due to high intensity artificial lighting sources, can be overcome. As further studies in the field of performance under higher levels of illumination are undertaken, we will probably design for even greater illumination levels in the future.



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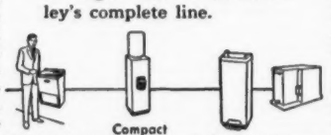

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PREVIEW:18

McCarran Field | *project*
Clark County Board | *client*
Welton Beckett and Associates, and John Repolgle | *architects*
Richard Bradshaw | *structural engineer*
Las Vegas, Nevada | *location*

General program

Construction of the new airline terminal facilities at McCarran Field, Las Vegas, Nevada, will begin this fall. Increased traffic over recent years markedly pointed to the need for additional facilities. In 1948 the airport accommodated 12 flights daily with a total of 35,106 passengers; in 1959 the numbers had risen to 99 flights daily with a total of 959,603 passengers.

Facilities of the new terminal will include two primary two-story buildings, one for ticketing, baggage and airline offices and the other a passenger waiting terminal and restaurant; passenger loading fingers with 16 gate positions which can accommodate the largest jet airliners; a control tower; a fire station; and parking for 1,400 automobiles.

Plan elements

Plans call for the present passenger facilities on the west side of the airfield to remain in use for private and non-scheduled aircraft, and for the new terminal to be located on the east side of the airport runways. The new airport will be utilized by United Airlines, Trans World Airlines, Western Airlines, Bonanza Air Lines, and Pacific Air Lines.

Careful two-level planning has separated passengers from airport ground operations through location of passenger activities on the second level of the central waiting building and use of pedestrian bridges.

The two-level hexagonal passenger waiting building with its tri-planned, thin-shell concrete roof will be the focal point of both the design and the function. The top level of the structure will contain passenger waiting facilities, a restaurant-coffee shop, cocktail lounge, nursery, concessions, and restrooms. It will be glass enclosed, affording waiting passengers and diners a commanding view of the airport and the surrounding valley landscape. From outside, the building will have a completely open appearance, an effect which will be enhanced by the use of low interior partitions throughout.

General features

The ground floor of the 38,850 square foot structure will house mechanical equipment including the air-conditioning system for the entire new terminal, a kitchen for the restaurant, a staff cafeteria, and storage areas.

The roof of the waiting building will be formed of three identical thin-shell vaulted concrete segments, each describing an arc from the ground to a peak of 40 feet and then back to the ground. The segments will be poured in place, using the same form three times, and then joined back-to-back, leaving three sculptured spines between them at the top. One of these will lead to the ticketing building and the other two to the airlines loading fingers.

The ticketing building is planned as a 500 foot long, 90 foot wide open "V". Ticketing desks, baggage claim racks, and concessions will occupy the main floor and airline office space will be provided on a mezzanine. Placing ticketing counters on the west side of the building with mezzanine offices above them will provide passengers with a two-story high open concourse on the east side. The 68,000 square foot structure will be of steel frame and masonry construction.

A full-length metal canopy will front the ticketing building to give cover for automobile, taxi and bus passengers. Above the canopy, the building will be faced with a pre-cast concrete slab screen over a glass wall.

Traffic elements

The emplaning passenger will enter the terminal complex via the ticketing building, check in at an airline desk and leave his baggage. Free of baggage, he will take a short escalator at the center of the building to a bridge which spans between the ticketing and central terminal. From the bridge, he will enter into the striking environment of the glass-enclosed passenger waiting terminal with its vaulted 25 foot high ceiling and its many public conveniences.

When ready to board, he will walk down one of two ramps to the one-story loading fingers which provide a total of 16 large jet airliner loading gates and positions for helicopter service. Provision has been made by the architects for expansion to 24 jet positions by extending the fingers.

Airport traffic will flow freely on the two levels, baggage and service on the ground and passengers above. Baggage and service trucks will travel under the bridge between the ticketing and terminal buildings and under the ramps so that they have direct access to the loading fingers, the bottom floor of the central terminal, and the west side of the ticketing building. The complete passenger complex encloses 159,150 square feet of space.

Included in the project is a new 95 foot high control tower, designed by the architects with a central elevator and four supporting concrete columns. The pre-cast concrete screen used on the ticketing building is repeated around the office and equipment house atop the tower. The control tower will utilize the latest in radio, radar, and telecommunication equipment.

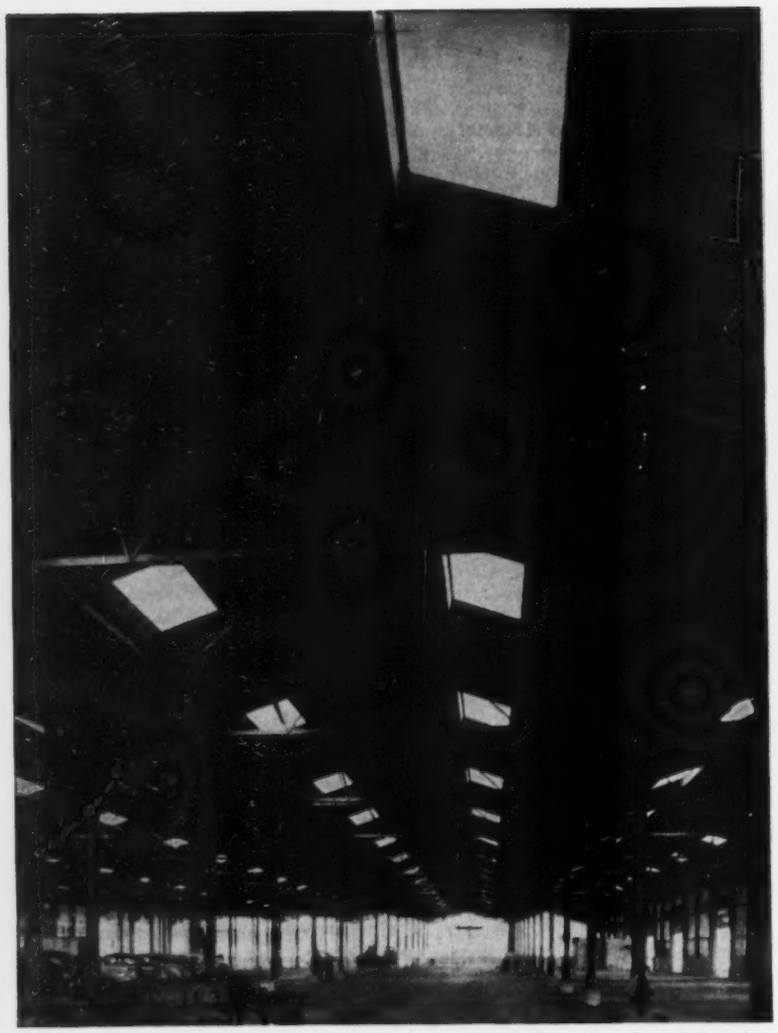
The airport fire station, which will include living quarters for firemen, will be located in a one-story steel frame building near the base of the tower.

Parking for 1,400 automobiles will be provided in front of the building complex. A covered area for 36 ready rental cars is included in the terminal design at the south end of the ticketing building.

Location of the new facilities on the east side of the airport is in the vertex formed by the runways. Additional land extending to Paradise Valley Road has already been acquired at a cost of $1,250,000 for parking and future facilities. This acquisition provides main access to the airport from U.S. Highway 91 via Bond and Paradise Valley Roads. Preparation of the new apron and site work at a cost of $760,000 is currently underway and nearing completion.

Costs

Terminal complex	$4,500,000



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EDITORIAL

ON STOCK SCHOOL PLANS: Perhaps the following event has happened or is happening in your state. Recently, the Legislature of the State of New York appropriated $1 million for the development of a series of 18 stock-school plans: six at the elementary level; six for junior high; and six for the senior high school level. The use of such stock plans would be mandatory for school districts, within the state, with populations of less than 70,000 people. Unincorporated school districts must use the plans. They may be relieved of using them only upon appeal to a special state commission.

Private architectural firms will be engaged to develop the stock plans. Their selection will be based on experience and other established professional criteria. Architects will also be required for supervision.

However, this program for providing economical stock plans for schools has provoked considerable comment *pro and con* concerning the validity of such a program. To their credit, architects have taken a positive point of view on the subject—although they have several serious reservations concerning the ultimate value of stock plans. They feel that the people of the State of New York should have the benefit of this kind of experimentation (albeit at the taxpayers' expense) and that the architectural profession may have an obligation in seeing that such a program works and that plans prepared for this purpose should be adapted as well as it is possible.

With this acceptance, architects have pointed out the negative elements within this program—that is, the series of "unknowns" which would exist with the implementation of such stock plans. One important question is directed toward the assumption of legal responsibility for the plans. Whose seal shall appear on the drawings? What are the actual, realistic areas or divisions of professional responsibility and liability in using these plans? How flexible will these plans be in meeting the specific educational and curricular needs—with the myriad variations that exist in modern educational theory and practice? Will the plans only evolve from unit-enrollment factors? The planning complexities for a modern educational facility are far too intricate to be enveloped in an all-embracing stock-plan program.

Architects also feel that school board members will be expecting complete drawings. They probably will be "shocked" to find that there are significant costs in adapting a building to a new site condition with its engineering complexities. The site orientation will, with certainty, vary from site to site, in its foundation, structural and mechanical engineering requirements. The well-meaning Legislature, in making this appropriation, did so with the thought that the costs of design and planning for new schools would be substantially reduced. However, it does not take any lengthy investigation of the inherent problems to conclude that there will be significant additive costs to any use of stock plans. School board members should be carefully informed of the truth—that is—the realistic difficulties to be encountered in using stock plans.

Let us assume that their use is a good idea. But the public must not be permitted to practice any form of self-deception which would allow it to think that the stock school plan solves community needs—*in toto.*

An architect simply cannot design a contemporary educational plant in a vacuum—anymore than an educator can teach in a vacuum. Pupils learn in living situations with "flesh-and-blood" teachers. We cannot make a fetish of automatic devices nor make formulae (as in stock plans) serve as a substitute for years of personal and extended professional experience. We would agree with many architects that, at best, these stock plans may serve as a "kind of knowledge"—as a valuable *reference tool* in developing fine criteria in new school buildings for our communities.

If architects are able to place before the bar of public opinion their professionally conditioned reservations, without bias, without favor, and with intelligent perspective, they will have performed an invaluable service to the public, their communities, and to their profession.

The public must be made aware, that in planning schools, whether from stock or original programs and plans, the learning environment of today's children—tomorrow's adults—is at stake. We cannot make them Saturday's children.

Perhaps, it may appear as an overstatement to some, but we feel that in planning school facilities, (as in the planning of any environment to nurture human institutions and needs) it is far better to fail in attempting exquisite things than to succeed in the department of the utterly contemptible.

Schools—the crucible of a civilized society—when measured in terms of young, growing human beings—are indeed, exquisite things. *JJC*

BOOKS

Handbook of Electronic Control Circuits *by John Markus. New York: McGraw-Hill Book Co., Inc., 1959. 347 pp., illus. $8.50.*
Well-indexed, subject-arranged, compilation of over 250 circuits which appeared during 1956-1959 in *Electronics*. Included with each one is a short description giving the general nature of the circuit, its performance characteristics, an explanation of how it works, practical data on components, and suggestions for applications.

Basic Electronics *by J. Daly and R. A. Greenfield. New York: The MacMillan Co., 1959. 226 pp., illus. $9.00.*
Written for technicians and practicing engineers, this book combines underlying theory and practical aspects of different types of phototubes. Treatment is descriptive and coverage broad, ranging from Einstein's photoelectric equation to details of phototube construction.

Lectures on Fourier integrals—with an author's supplement on monotonic function, Stieltjes integrals, and harmonic analysis *by Salomon Bochner. Translated from the original by Morris Tenenbaum and Harry Pollard. Princeton, N. J.: Princeton University Press, 1959. 333 pp. $5.00.*
Translated from German to avail group-theorists and practioners in distributions the historical and concrete problems which give rise to these disciplines.

Vacuum Valves in Pulse Technique, Second revised edition *by P. A. Neeteson. New York: The MacMillan Co., 1959. 195 pp., illus.*
A mathematical treatment of methods of determining the behavior of a network in which electronic tubes are used as switches. Revised edition contains new material on blocking oscillator circuits and bibliography of 47 titles.

Reading German for Scientists *by Hans Eichner and Hans Hein. New York: John Wiley & Sons, Inc., 1959. 207 pp. $5.25.*
Designed to develop quickly a reading knowledge of German. Scientific terms introduced immediately. Considerable reading material from published German scientific literature is included.

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58	Ceco Steel Products
43	Circle F Mfg. Co.
48-49	P & F Corbin Div., American Hardware Corp.
60	Cordley & Hayes
31	Corning Glass Works
32-33	Day-Bright Lighting, Inc.
21	Dow Corning Corp.
62	Durez Plastics Div., Hooker Chemical Corp.
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63	Oscar C. Rixson Co.
38	Robbins Flooring Co.
38	Rotolite Sales Corp.
34, 36, 38, 39	Russell & Erwin Div., American Hardware Corp.
54-55	Sargent & Company
37	Sedgwick Machine Works
34	Stacor Equipment Co.
53	Standard Dry Wall Products, Inc.
44	Stanpat Company
31	Halsey W. Taylor Co.
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45	Townsend Company
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42	Zonolite Company

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June 12-24 AIA-ACSA TEACHING SEMINAR: Sagamore, N. Y.

13-17 TECHNICAL WRITERS' INSTITUTE: eighth annual meeting, Rensselaer Polytechnic Institute, Troy, N. Y.

15-18 BRITISH ARCHITECTS' CONFERENCE: Manchester, England. For information write G. R. Ricketts, Secretary, Royal Institute of British Architects, 66 Portland Place, London W. 1, England.

20-22 AMERICAN SOCIETY OF REFRIGERATING ENGINEERS: annual meeting, Royal York Hotel, Toronto, Canada.

26-1 AMERICAN SOCIETY FOR TESTING MATERIALS: annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J.

July 10-22 ENGINEERING SEMINARS ON ATOMIC SHELTER: The Pennsylvania State University, University Park, Pa. (also to be held July 24-August 5.)

23-15 AMERICAN INSTITUTE OF ARCHITECTS: U. S. Travel Agency Tour of Europe (to August 23 if Russia included).

August 12-30 A/E NEWS-IVA ARCHITECTS' TOUR of Brazil, Peru, Ecuador and Colombia. Contact Inter-American Visitors Assn., 15 West 46 St., New York 36, N. Y.

20-3 ANNUAL MEXICAN ARCHITECTURAL SEMINAR TOUR: includes areas of architectural interest from Laredo to Oaxaco.

Oct. 2-4 AMERICAN INSTITUTE OF ARCHITECTS: Idaho Chapter host chapter, ninth annual northwest AIA conference, Sun Valley, Idaho.

2-13 INTERNATIONAL SEMINAR ON INDUSTRIAL ARCHITECTURE: Kazimierz, Poland.

5 SIXTH ANNUAL ARCHITECTS' TOUR OF JAPAN: 24-day tour. For further information contact Kenneth M. Nishimoto, AIA, 263 S. Los Robles Ave., Pasadena, Calif.

17-21 NATIONAL METAL EXPOSITION: Philadelphia, Pa.

19-23 AMERICAN INSTITUTE OF ARCHITECTS: annual convention of California Chapter, San Francisco, Calif.

26-27 1960 COMPUTER APPLICATIONS SYMPOSIUM: sponsored by Armour Research Foundation of Illinois Institute of Technology, Morrison Hotel, Chicago.

November 18-22 AIR-CONDITIONING AND REFRIGERATION INSTITUTE: annual meeting, Hollywood Beach, Fla.

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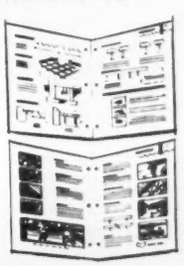

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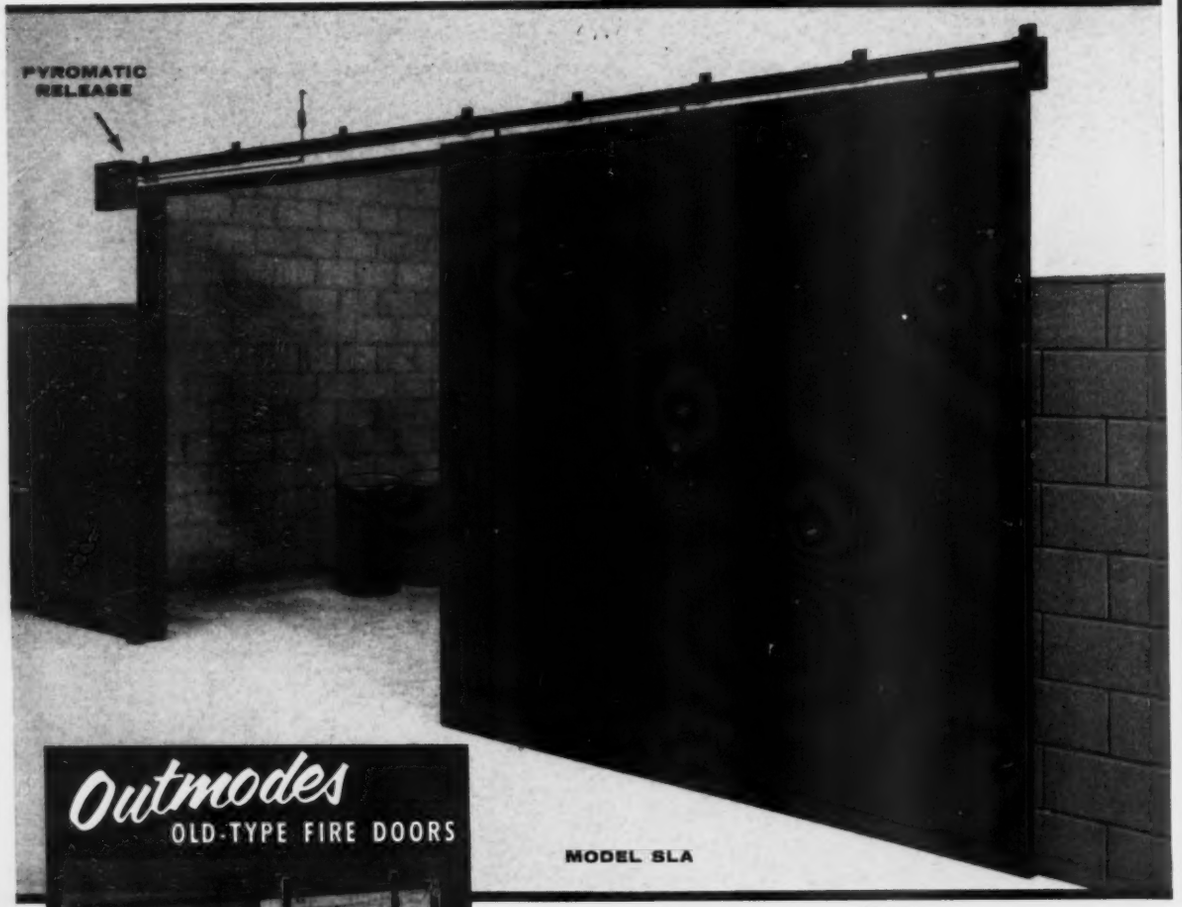

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